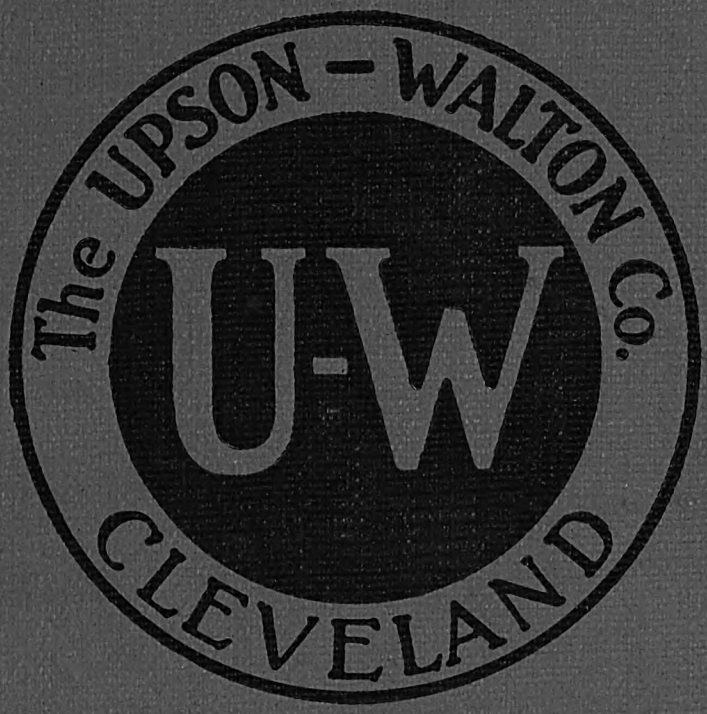

NEW YORK PITTSBURGH CHICAGO

DETROIT NEW ORLEANS DENVER

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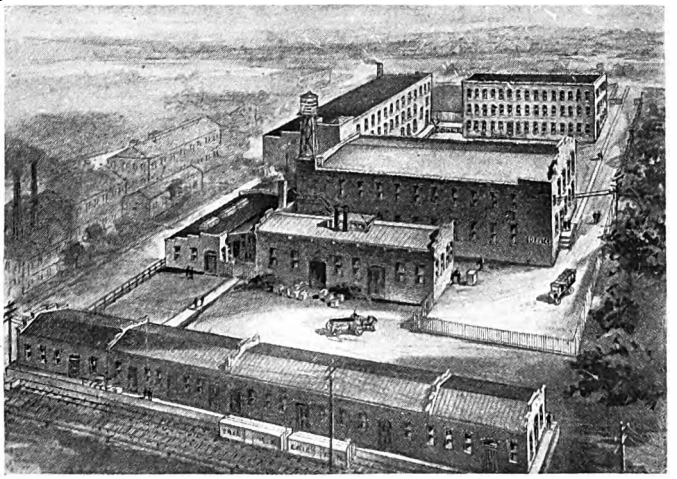
The UPSON-WALTON Co.

Established 1871 — Incorporated 1893

Manufacturers, Importers and Jobbers
in
Ship, Mill, Mine, Railroad and Drillers' Supplies



View of the Upson-Walton Co. Wire Rope Mill, Newark, N. J.

Sail and Rigging Lofts—
Forging and Machine Shops—
Fireproof and Waterproof Fabrics—
Complete Vessel Outfits.

Main Office, 1310 West 11th Street - CLEVELAND, OHIO
New York Office, 291 Broadway — Wire Rope Mill, Newark, N. J.

BRANCH OFFICES

Boston, Mass. — Pittsburgh, Pa. — Chicago, Ill.
New Orleans, La. — Detroit, Mich. — Denver, Colo.

(1920)

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FOREWORD

WE venture to submit this catalog for your approval in the hope that it may prove of service to you.

Owing to the occasional necessity of change in standard lists and the frequency of change in market prices and discounts, any orders sent to us based on this catalog are subject to such changes as may have occurred subsequent to date of publication.

The tables enclosed herein have been carefully computed and are substantially accurate but are not guaranteed.

THE UPSON-WALTON CO.

Catalog Compiled, Printed and Bound by
The Gardner Printing Co., Cleveland, Ohio

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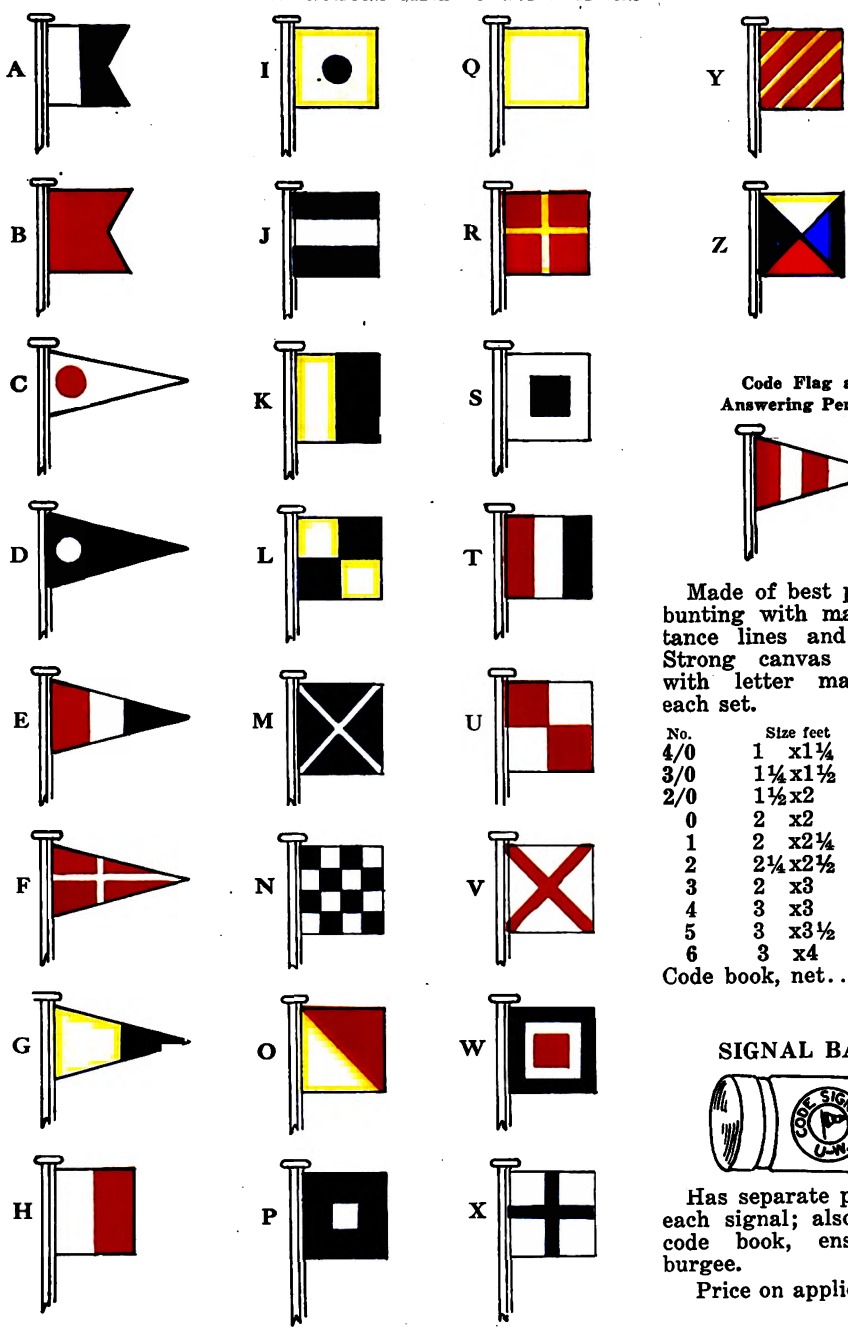
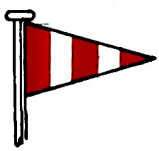
Up7c

INTERNATIONAL CODE OF SIGNALS

21 FLAGS AND 6 PENNANTS



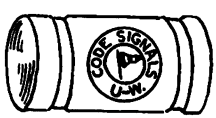
Code Flag and Answering Pennant



Made of best pure wool bunting with manila distance lines and toggles. Strong canvas headings with letter marked on each set.

No.	Size feet	Per Set
4/0	1 x1¼	$19.25
3/0	1¼x1½	21.50
2/0	1½x2	24.50
0	2 x2	26.50
1	2 x2¼	29.75
2	2¼x2½	32.00
3	2 x3	33.00
4	3 x3	40.00
5	3 x3½	43.00
6	3 x4	47.50
Code book, net.....		1.50

SIGNAL BAGS



Has separate pocket for each signal; also one for code book, ensign and burgee.

Price on application.

456647.
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FLAGS AND PENNANTS

YACHT CLUB FLAGS

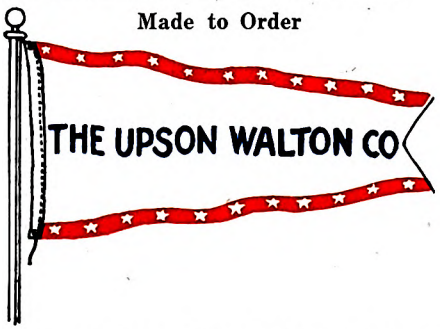
Pure Wool Bunting

We are prepared to make up on short notice any yacht club signals wanted, and will be pleased to quote prices upon receipt of specifications and a sketch or design. The usual sizes are:

12x18, 18x24, 20x30, 24x36, 28x42, 32x48, 40x60 inches

BURGEES AND HOUSE FLAGS

Made to Order

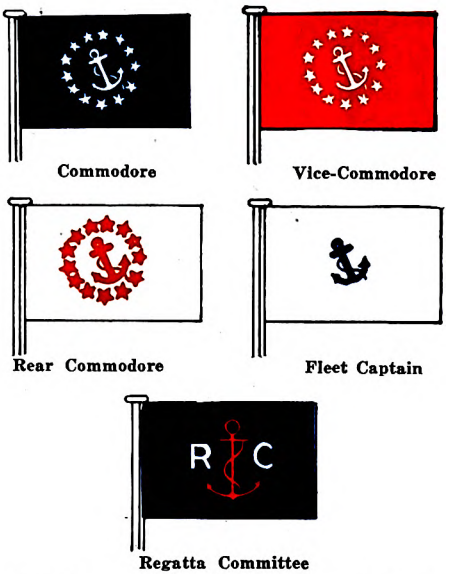


Made of best quality wool bunting in any desired colors. Special designs will be made up promptly on receipt of specifications. Prices will vary according to the design and labor involved. Any size can be furnished, and those commonly used are as follows:

12x18 in.	30x60 in.	7½x15 ft.
18x24 in.	40x60 in.	9 x18 ft.
20x30 in.	3x 6 ft.	10 x20 ft.
24x36 in.	4x 8 ft.	11 x21 ft.
28x42 in.	5x10 ft.	12 x25 ft.
32x48 in.	6x12 ft.	15 x30 ft.

OFFICERS' PENNANTS

Pure Wool Bunting

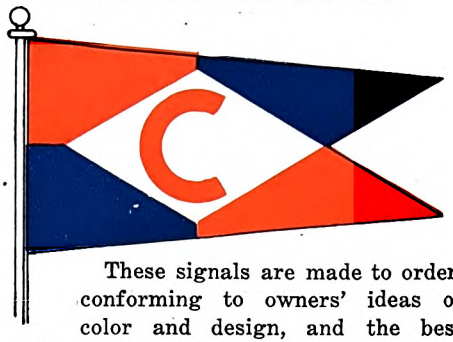


Commodore — Vice-Commodore — Rear Commodore — Fleet Captain — Regatta Committee

Made of best material in the most durable manner. The following sizes can be furnished promptly.

12x18 in.,	ea.,	$1.75	28x42 in.,	ea.,	$3.00
16x24 in.,	ea.,	2.00	32x48 in.,	ea.,	3.35
20x30 in.,	ea.,	2.25	36x54 in.,	ea.,	3.75
24x36 in.,	ea.,	2.50	40x60 in.,	ea.,	4.15

OWNERS' PRIVATE SIGNALS



These signals are made to order, conforming to owners' ideas of color and design, and the best quality of wool bunting is used. Prices will be quoted on receipt of specifications and sketch, or we will submit designs if so desired.

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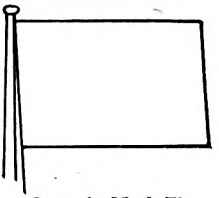
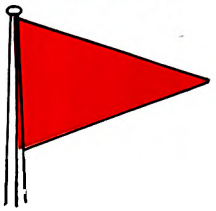
YACHT, WEATHER AND RAILROAD SIGNALS

SPECIAL YACHT SIGNALS

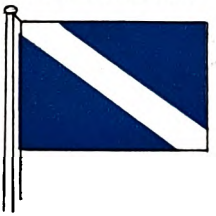
Absent Flag



Owner's Meal Flag



Crew Meal Flag

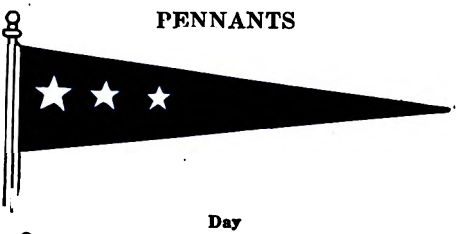


Guest Flag

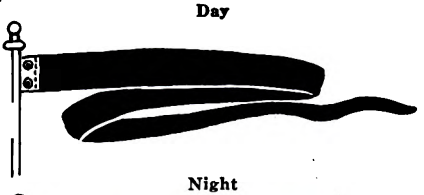
Made of best wool bunting, any size furnished promptly. Usual sizes are:
12x18, 16x24, 20x30, 24x36, 32x48, 40x60 inches.

Prices on request.

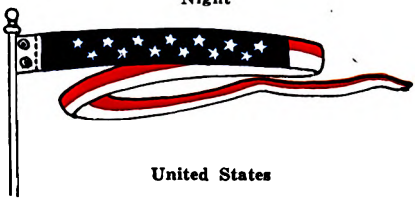
PENNANTS



Day



Night

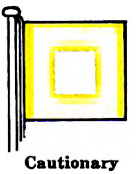


United States

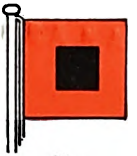
Made of best wool bunting, all sizes, 1 to 30 feet.

Prices on request.

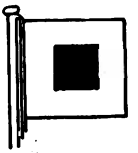
U. S. WEATHER BUREAU SIGNALS



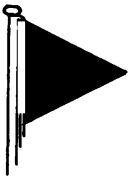
Cautionary



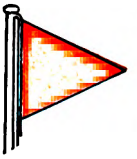
Storm



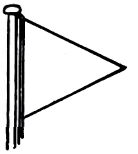
Cold Wave



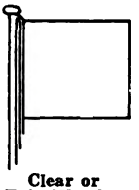
Temperature



Easterly Winds

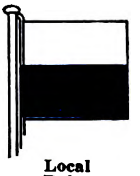


Westerly Winds



Clear or Fair Weather

Rain or Snow

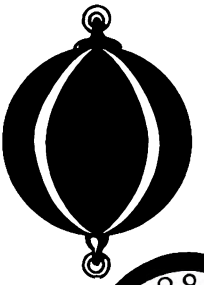


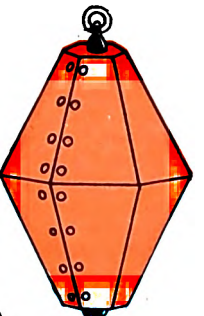
Local Rains

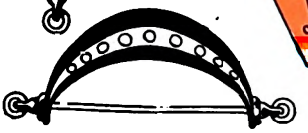
Made of best wool bunting, either singly or in sets, the usual sizes are:

3x3, 4x4, 6x6, 8x8 feet

SIGNAL BALLS AND CONES







Balls and cones are made all black, black and white or all red. They are collapsible and can be stowed flat. Regular size is 18 inches diameter.

Prices on request.

RAILROAD SIGNALS

Red, white, blue, green or yellow, any size. Prices on request.

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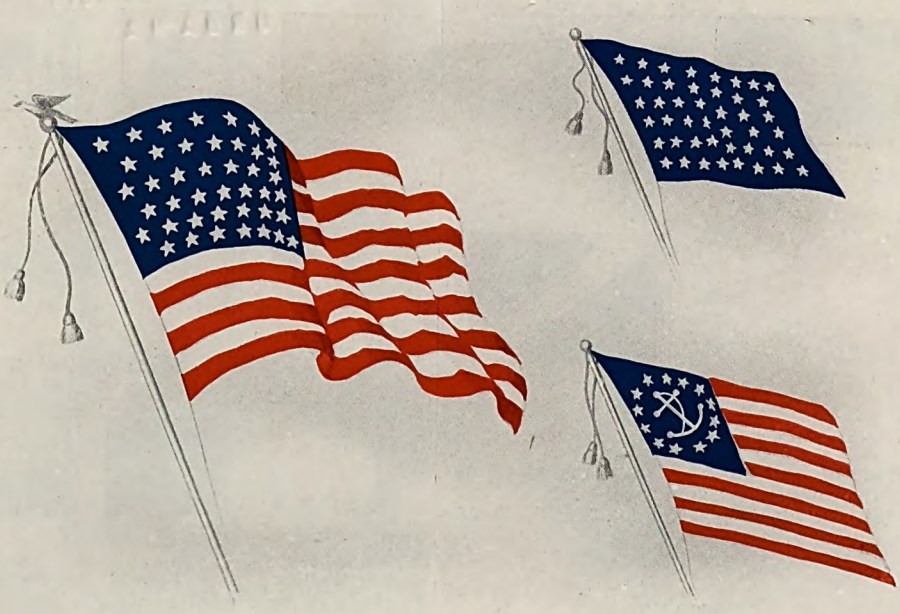
FLAGS



UNITED STATES ENSIGN

Sewed Stars and Stripes

U-W flags are all made of Navy Pure Wool Bunting. Seams and stripes are all double lock stitched. Stars are sewed on both sides. Reinforced head and fly end. Small sizes have canvas heading and brass grommets, 10x15 feet have rope thru heading and galvanized thimbles for fastening.

St. Clair Flags are made from a special Bunting absolutely fast to Rain, Snow and Sun, not quite as good as the U-W grade, but will answer for all ordinary requirements.

Size, Ft.	U-W Each	St. Clair Each	Size, Ft.	U-W Each	St. Clair Each
2 x 3	$ 1.36	$1.00	8 x15	$13.30	$ 7.20
2½x 4	1.80	1.30	8 x16	14.10	7.50
3 x 5	2.30	1.60	9 x14	13.80	....
3 x 6	2.70	1.70	9 x15	14.70	....
4 x 6	3.20	2.10	9 x16	15.60	....
4 x 7	3.70	2.20	9 x18	17.40	....
4 x 8	4.16	2.40	10 x15	16.40	9.00
5 x 8	5.00	3.00	10 x16	17.40	....
5 x 9	5.60	....	10 x18	19.40	10.40
5 x10	6.10	3.50	10 x20	21.40	11.50
6 x 9	6.40	3.70	11 x22	25.50	....
6 x10	7.00	4.00	12 x18	22.76	....
6 x12	8.60	4.60	12 x20	25.10	....
7 x11	8.70	....	12 x24	30.30	....
7 x12	9.70	....	12 x22	27.50	....
7 x14	11.10	....	12½x25	32.60	....
8 x12	10.80	6.00	15 x30	47.30	....

UNITED STATES JACK

Navy Wool Bunting

Size	Each	Size, Ft.	Each
18 x24 in.	$1.40	5 x 7	$ 5.75
20 x30 in.	1.70	6 x 8	7.50
2 x 3 ft.	1.90	7 x10	10.50
3 x 4 ft.	2.80	8 x10	11.50
4 x 5 ft.	3.50	8 x12	13.50
4 x 6 ft.	4.00	9 x12	14.50
4½x 6 ft.	4.50	12 x15	20.50

UNITED STATES YACHT ENSIGN

Navy Wool Bunting

Size, In.	Each	Size, Ft.	Each
12x18	$1.20	4x 6	$ 3.50
16x24	1.50	4x 7	4.00
20x30	1.60	5x 8	5.50
24x36	1.70	6x 9	7.00
28x42	2.00	6x10	7.60
30x48	2.20	8x12	11.50
32x54	2.35	8x15	14.00
36x60	2.50	10x15	17.00

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FLAGS AND THEIR USE

Flag Officers' Signals are mostly colored:—Blue for Commodore, Red for Vice-Commodore, and White for Rear-Commodore.

The following flags are not considered as colors:—

Night Pennant (blue) is hoisted at the main truck from sundown to 8 a. m., also occasionally used as a tell-tale when racing or sailing.

Owner's Absent Flag (blue rectangular) is flown from the main starboard spreader when yacht is at anchor only. It denotes owner is not on board, but should never be flown when under way.

Owner's Meal Flag (white rectangular) is flown from the main starboard spreader and denotes the owner is at meals. Boarding a yacht when this flag is flying is considered bad form.

Meal pennants should not be flown when under way.

Crew Meal Flag (red triangular) is flown from the fore-port spreader on schooners and main-port spreader on single-masted yachts. This denotes the crew is at meals.

Church Pennant (white triangular, with blue cross) is the only flag ever displayed above the ensign, and only during divine service, with Yacht at anchor.

Water Flag (white rectangular, with word "water" in centre, in black letters) is the signal for water boat. May be displayed from any part of the yacht.

U. S. WEATHER SIGNALS

Storm Warning (a red flag, eight feet square, with black centre, three feet square), indicates that a storm of marked violence is expected. This flag is never used alone.

Red Pennant (eight feet hoist and fifteen feet fly) displayed with the flags, indicates easterly winds, that is, from the northeast to south, inclusive, and that the storm centre is approaching.

White Pennant (eight feet hoist and fifteen feet fly) displayed with the flags, indicates westerly winds, that is, from north to southwest, inclusive, and that the storm centre has passed.

Red Pennant if hoisted above the Storm Warning, winds are expected from the Northeast Quadrant; when below, from the Southeast Quadrant.

White Pennant if hoisted above the Storm Warning, winds are expected from the Northwest Quadrant; when below, from the Southwest Quadrant.

Night Storm Warnings—By night a red light will indicate easterly winds; a white above a red light will indicate westerly winds.

Hurricane Warning (two storm warning flags, red and black centres, displayed one above the other) indicates the expected approach of a tropical hurricane or an extremely severe and dangerous storm.

No Night Hurricane Warnings are displayed.

A yellow flag with white centre is a cautionary signal.

Signals should be read from the top of the staff downward. These signals indicate the weather forecasts for the twenty-four hours commencing at 8 o'clock a. m.

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REGULATION OF MOTOR BOATS

An Act To amend laws for preventing collisions of vessels and to regulate equipment of certain motor boats on the navigable waters of the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the words "motor boat" where used in this Act shall include every vessel propelled by machinery and not more than sixty-five feet in length except tug boats and tow boats propelled by steam. The length shall be measured from end to end over the deck, excluding sheer: Provided, That the engine, boiler, or other operating machinery shall be subject to inspection by the local inspectors of steam vessels, and to their approval of the design thereof, on all said motor boats, which are more than forty feet in length, and which are propelled by machinery driven by steam.

Sec. 2, That motor boats subject to the provisions of this Act shall be divided into classes as follows:

Class one. Less than twenty-six feet in length.

Class two. Twenty-six feet or over and less than forty feet in length.

Class three. Forty feet or over and not more than sixty-five feet in length.

Sec. 3. That every motor boat in all weathers from sunset to sunrise shall carry the following lights, and during such time no other lights which may be mistaken for those prescribed shall be exhibited.

(a) Every motor boat of class one shall carry the following lights:

First. A white light aft to show all around the horizon.

Second. A combined lantern in the forepart of the vessel and lower than the white light aft, showing green to the starboard and red to port, so fixed as to throw the light from right ahead to two points abaft the beam on their respective sides.

(b) Every motor boat of classes two and three shall carry the following lights:

First. A bright white light in the fore part of the vessel as near the stem as practicable, so constructed as to show an unbroken light over an arc of the horizon of twenty points of the compass, so fixed as to throw the light ten points on each side of the vessel, namely, from right ahead to two points abaft the beam on either side. The glass or lens shall be of not less than the following dimensions:

Class two. Nineteen square inches.

Class three. Thirty-one square inches.

Second. A white light aft to show all around the horizon.

Third. On the starboard side a green light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side. On the port side a red light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the port side. The glasses or lenses in the said side lights shall be of not less than the following dimensions on motor boats of—

Class two. Sixteen square inches.

Class three. Twenty-five square inches.

On and after July first, nineteen hundred and eleven, all glasses or lenses prescribed by paragraph (b) of section three shall be fresnel or fluted. The said lights shall be fitted with inboard screens of sufficient height and so set as to prevent these lights from being seen across the bow and shall be of not less than the following dimensions on motor boats of—

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REGULATION OF MOTOR BOATS—CONTINUED

Class two. Eighteen inches long.

Class three. Twenty-four inches long:

Provided, That motor boats as defined in this Act, when propelled by sail and machinery or under sail alone shall carry the colored lights suitably screened but not the white lights prescribed by this section.

Sec. 4. (a) Every motor boat under the provisions of this Act shall be provided with a whistle or other sound-producing mechanical appliance capable of producing a blast of two seconds or more in duration, and in the case of such boats so provided a blast of at least two seconds shall be deemed a prolonged blast within the meaning of the law.

(b) Every motor boat of class two or three shall carry an efficient fog horn.

(c) Every motor boat of class two or three shall be provided with an efficient bell, which shall be not less than eight inches across the mouth, on board of vessels of class three.

Sec. 5. That every motor boat subject to any of the provisions of this Act, and also all vessels propelled by machinery other than by steam, more than sixty-five feet in length, shall carry either life preservers, or life belts, or buoyant cushions, or ring buoys or other device, to be prescribed by the Secretary of Commerce, sufficient to sustain afloat every person on board and so placed as to be readily accessible. All motor boats carrying passengers for hire shall carry one life preserver of the sort prescribed by the regulations of the board of supervising inspectors for every passenger carried, and no such boat while so carrying passengers for hire shall be operated or navigated except in charge of a person duly licensed for such service by the local board of inspectors. No examination shall be required as the condition of obtaining such a license, and any such license shall be revoked or suspended by the local board of inspectors for misconduct, gross negligence, recklessness in navigation, intemperance, or violation of law on the part of the holder, and if revoked, the person holding such license shall be incapable of obtaining another such license for one year from the date of revocation: Provided, That motor boats shall not be required to carry licensed officers except as required in this Act.

Sec. 6. That every motor boat and also every vessel propelled by machinery other than by steam, more than sixty-five feet in length, shall carry ready for immediate use the means of promptly and effectually extinguishing burning gasoline.

Sec. 7. That a fine not exceeding one hundred dollars may be imposed for any violation of this Act. The motor boat shall be liable for the said penalty and may be seized and proceeded against, by way of libel, in the district court of the United States for any district within which such vessel may be found.

Sec. 8. That the Secretary of Commerce shall make such regulations as may be necessary to secure the proper execution of this Act by collectors of customs and other officers of the Government. And the Secretary of the Department of Commerce may, upon application therefor, remit or mitigate any fine, penalty, or forfeiture relating to motor boats except for failure to observe the provisions of section six of this Act.

Sec. 9. That all laws and parts of laws only in so far as they are in conflict herewith are hereby repealed: Provided, That nothing in this Act shall be deemed to alter or amend acts of Congress embodying or revising international rules for preventing collisions at sea.

Sec. 10. That this Act shall take effect on and after thirty days after its approval.

REGULATIONS

1. All violations of the above act must be reported to the Department of Commerce (Bureau of Navigation) through collectors of customs regardless of mitigating circumstances, as authority to mitigate and remit the penalties under the laws mentioned is vested solely in the Secretary of Commerce.

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REGULATION OF MOTOR BOATS—CONTINUED

2. The act defines the words "motor boat" (i. e., the class of vessels subject to its requirements) as including every vessel propelled by machinery and not more than 65 feet in length, except tugboats and towboats propelled by steam. The term, therefore, includes boats temporarily or permanently equipped with detachable motors, and such vessels, when so equipped, are subject to this act.

Lights

3. The lights provided for in section 3 of the act above are running lights for motor boats subject to the provisions of the act in lieu of the lights prescribed, respectively, by article 2 of the act approved June 7, 1897 (covering certain harbors, rivers, and inland waters of the United States); rule 3 of the act approved February 8, 1895 (covering the Great Lakes and their connecting and tributary waters); and rules 3, 5, 6, and 7 of section 4233 of the Revised Statutes (covering western rivers). The penalty for failure to carry such lights is a fine not exceeding $100.

4. The lights provided for in section 3 are not in conflict with the anchor lights, lights for pilot and fishing vessels, and other lights provided in the acts above cited.

Collectors of customs and others will observe that the penalties for violations of existing laws not in conflict with this act remain unchanged.

5. Motor boats of class 1 which do not carry the two-color combination light forward, but have the red and green side lights separated, should carry also a white bow light (in addition to the white after light which must be carried on all classes of motor boats). It is desired, however, that class 1 motor boats comply strictly with the requirements of section 3 as regards the kinds of lights to be used.

6. No penalty is incurred by motor boats for a failure to carry lights between the hours of sunrise and sunset.

7. If a motor boat, through temporary disablement of the machinery or lack of gasoline, or for any other reason, finds it necessary to proceed under sail, in whole or in part, the white lights should be extinguished and she should proceed with her colored lights only. This does not convert a motor boat into a sailboat, however, and all other motor boat equipment should be carried.

8. The aft light should be higher and so placed as to form a range with the forward light, and should be clear of house awnings and other obstructions.

9. The law does not specify the size of lights to be carried on motor boats of class 1. Such lights should be large enough, however, to accomplish the purpose intended, and it is suggested that the illuminated portion of such lights or lenses should not be less than 3 inches in diameter.

Whistle, Fog Horn, and Bell

10. No size or style of whistle, fog horn, or bell (except the bell for class 3) is prescribed, provided it is available and sufficient for the use for which it is intended. The word "efficient" must be taken in its ordinary sense, considered with reference to the object intended by the provisions in which the word appears, namely, the production of certain signals.

11. A mouth whistle capable of producing a blast of two seconds or more in duration, which can be heard for at least one-half a mile, has been held to be in compliance with the law.

12. Fog horns can not take the place of whistles on motor boats of classes 2 and 3.

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REGULATION OF MOTOR BOATS—CONTINUED

Life Preservers and Live-Saving Devices

On Motor Boats Not Carrying Passengers for Hire

13. Every motor boat not carrying passengers for hire must have life preservers or life belts or buoyant cushions or ring buoys or other device, which should be of types approved by the Board of Supervising Innspectors, sufficient to sustain afloat every person on board. This includes members of the crew, children, and babies.

In addition the Department authorizes life preservers and buoyant cushions for motor boats not carrying passengers for hire under the following conditions: Each life preserver or buoyant cushion shall be capable of sustaining afloat for a continuous period of 24 hours an attached weight so arranged that whether the said weight be submerged or not there shall be a direct downward gravitation pull upon such life preserver or cushion of at least 20 pounds. If a buoyant cushion is furnished for more than one person, its capacity must be proportionately greater.

No such life preservers or buoyant cushions stuffed or filled with granulated cork or other loose granulated material and no pneumatic life preservers or cushions will be approved.

Planks, gratings, floorings, oars, corks on ropes or fish nets, empty kegs or casks, wooden boxes, small boats in tow, etc., are not approved as substitutes for life preservers, life belts, buoyant cushions, or ring buoys, but wooden life floats may be used, provided their dimensions shall not be less than 4 feet in length, 14 inches in breadth, 2 inches in thickness, and made of well-seasoned white pine, or of any other wood not exceeding white pine in weight per cubic foot.

Samples of other substitutes for the articles mentioned must first be submitted to the Supervising Inspector General, Steamboat-Inspection Service, for examination and approval.

On Motor Boats Carrying Passengers for Hire

Motor boats carrying passengers for hire shall carry one life preserver of the sort prescribed by the Board of Supervising Inspectors for every passenger carried, and the person in charge must be duly licensed.

Motor boats hired at launch liveries and operated by the liveryman or his employee are construed as carrying passengers for hire; but if the motor boat is operated by the hirer himself, it is not considered a carriage of passengers for hire even though he may take other persons on board, provided, of course, he does not receive compensation for carrying these other persons.

Fire-Extinguishing Apparatus

14. No specific means of promptly and effectually extinguishing burning gasoline are prescribed. Besides the usual extinguishers and suitable chemicals, salt or sand in sufficient quantities will serve the purpose in some cases. The salt or sand (preferably the two mixed) should be kept in a pail or receptacle ready for immediate use, and may be marked "Use Only in Case of Fire."

The following fire extinguishers have demonstrated a capacity for extinguishing burning gasoline and are approved by the Department: Alert, Atlas, Badger, Bear, Buscoba (Alert), Dick's Little Fire Queen No. 3D, Durkee, Gold Medal No. 1, Hale (Alert), Hayward, Kar-bolene, Keystone, Knickerbocker, Louisville, Northern, Paragon, Peerless (Alert), Protector, Protector No. 10, Pyrene, Railway and Marine, Safety, B Safe Guard, Salvage, Security, Sentry, Success, Turner, and Underwriters No. 6.

Licensed Officers, and Inspection

15. In lieu of the inspection of steam vessels now provided by sections 4417, 4418, and 4426, Revised Statutes, it is now required that, after due inspection or personal observation, the design of the engine, boiler, or other operating machinery of motor boats more than 40 feet in length and not more than 65 feet in length, propelled by machinery driven by steam, shall be approved by the local inspectors.

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REGULATION OF MOTOR BOATS—CONTINUED

All steam vessels more than 65 feet in length are subject to inspection as heretofore.

Motor boats propelled otherwise than by steam of above 15 gross tons carrying freight or passengers for hire, but not engaged in fishing as a regular business, are subject to inspection whether under or over 65 feet in length.

The only officer required to be carried on motor boats within the contemplation of the act of June 9, 1910, is the licensed operator provided for in the act.

Documents and Name

16. All motor boats of 5 net tons or over engaged in trade must be documented; that is to say, licensed by the collectors of customs. Vessels under 5 net tons are not documented in any case. The license of the vessel obtained from the collector of customs (designated a document) is additional to and must not be confounded with the license required for the operator of a motor boat.

Documented vessels must have name and home port on stern and name on each bow. Tonnage measurement is necessary only in case of vessels requiring to be documented.

The Department recommends that the name be conspicuously displayed on undocumented motor boats.

17. Motor boats are required to have on board two copies of the pilot rules to be observed by them, which will be furnished by collectors of customs and local inspectors of steam vessels on request. Copies of this circular should be inserted therein.

Tabulated Statement of Equipment Required

Carrying Passengers for Hire

	Sec. 3.	Sec. 4.	Sec. 5.	Sec. 6.
Class 1	Combination light forward. White light aft.	Whistle	Life preservers. Licensed operator.	Means for extinguishing burning gasoline.
Class 2	White lights forward and aft and colored side lights, all with fresnel or fluted lenses.	Whistle, bell, and fog horn.	Same as class 1.	Same as class 1.
Class 3	Same as class 2.	Same as class 2.	Same as class 1.	Same as class 1.

Not Carrying Passengers for Hire

	Sec. 3.	Sec. 4.	Sec. 5.	Sec. 6.
Class 1	Combination light forward. White light aft.	Whistle	Life preservers or life-saving devices prescribed by act.	Means for extinguishing burning gasoline.
Class 2	White lights forward and aft and colored side lights, all with fresnel or fluted lenses.	Whistle, bell, and fog horn.	Same as class 1.	Same as class 1.
Class 3	Same as class 2.	Same as class 2.	Same as class 1.	Same as class 1.

In addition to the above, two copies of the pilot rules must be carried on all motor boats.

No equipment, except anchor lights after sunset, is required on motor boats when not being navigated.

WILLIAM C. REDFIELD,
Secretary.

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RULES FOR WARNING SIGNALS

ON VESSELS WORKING ON WRECKS OR ENGAGED IN DREDGING OR OTHER SUBMARINE WORK

Act of Congress, May 25, 1914.

In pursuance of the provisions of said act, the executive committee of the Board of Supervising Inspectors, Steamboat-Inspection Service, on July 22, 1914, adopted the following rules, which were approved by the Secretary of Commerce on July 28, 1914, and which read as follows:

Rules for lights and day signals to be carried by vessels, dredges of all types, and vessels working on wrecks or other obstructions to navigation, or moored for submarine operations or made fast to a sunken object which may drift with the tide or be towed.

Rule 1. Rule for signals to be displayed by a towing vessel when towing a submerged or partly submerged object upon a hawser when no signals are displayed upon the object which is towed.

The vessel having the submerged object in tow shall display by day, where they can best be seen, two shapes, one above the other, not less than 6 feet apart, the lower shape to be carried not less than 10 feet above the deck houses. The shapes shall be in the form of a double frustrum of a cone, base to base, not less than 2 feet in diameter at the center nor less than 8 inches at the ends of the cones, and to be not less than 4 feet lengthwise from end to end, the upper shape to be painted in alternate horizontal stripes of black and white, 8 inches in width, and the lower shape to be painted a solid bright red.

By night the towing vessel shall display the regular side lights, but in lieu of the regular white towing lights shall display four lights in a vertical position not less than 3 nor more than 6 feet apart, the upper and lower of such lights to be white, and the two middle lights to be red, all of such lights to be of the same character as are now prescribed for the regular towing lights.

Rule 2. Rule for steamers, derrick boats, lighters, or other types of vessels made fast alongside a wreck, or moored over a wreck which is on the bottom or partly submerged, or which may be drifting.

Steamers, derrick boats, lighters, or other types of vessels made fast along-side a wreck, or moored over a wreck which is on the bottom or partly submerged, or which may be drifting, shall display by day two shapes of the same character and dimension and displayed in the same manner as required by the foregoing rule, except that both the shapes shall be painted a solid bright red, but where more than one vessel is working under the above conditions, the shapes need be displayed only from one vessel on each side of the wreck from which it can best be seen from all directions.

By night this situation shall be indicated by the display of a white light from the bow and stern of each outside vessel or lighter not less than 6 feet above the deck, and in addition thereto there shall be displayed in a position where they may best be seen from all directions two red lights carried in a vertical line not less than 3 feet nor more than 6 feet apart, and not less than 15 feet above the deck.

Rule 3. Rule for dredges which are held in stationary position by moorings or spuds.

Dredges which are held in stationary position by moorings or spuds shall display by day two red balls not less than 2 feet in diameter and carried in a vertical line not less than 3 feet nor more than 6 feet apart, and at least 15 feet above the deck house and in such a position where they can best be seen from all directions. By night they shall display a white light at each corner, not less than 6 feet above the deck, and in addition thereto there shall be displayed in a position where they may best be seen from all directions two red lights carried in a vertical line not less than 3 feet nor more than 6 feet apart, and not less than 15 feet above the deck. When scows are moored alongside a dredge in the foregoing situation they shall display a white light on each outboard corner not less than 6 feet above the deck.

Rule 4. Rule for self-propelling suction dredges under way with their suctions on the bottom.

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RULES FOR WARNING SIGNALS—CONTINUED

Self-propelling suction dredges under way with their suction on the bottom shall display by day the same signals as are used to designate any steamer not under control; that is to say, two black balls not less 2 feet in diameter and carried not less than 15 feet above the deck house, and where they may best be seen from all directions.

By night they shall carry, in addition to the regular running lights, two red lights of the same character as the masthead light, in the same vertical plane and underneath the masthead light, the red lights to be not less than 3 feet nor more than 6 feet apart and the upper red light to be not less than 4 feet and not more than 6 feet below the white masthead light, and on or near the stern two red lights in the same vertical plane not less than 4 feet nor more than 6 feet apart, to show through four points of the compass; that is, from right astern to two points on each quarter.

Rule 5. Rule for vessels which are moored or anchored and engaged in laying pipe or operating on submarine construction or excavation.

Vessels which are moored or anchored, and engaged in laying pipe or operating on submarine construction or excavation shall display by day, not less than 15 feet above the deck, where they can best be seen from all directions, two balls not less than 2 feet in diameter, in a vertical line not less than 3 feet and not more than 6 feet apart, the upper ball to be painted in alternate black and white vertical stripes 6 inches wide, and the lower ball to be painted a solid bright red. By night they shall display three red lights, carried in a vertical line not less than 3 feet nor more than 6 feet apart and not less than 15 feet above the deck, and in such position as may best be seen from all directions.

All the lights required by these special rules for dredges, wrecking boats, lighters, etc., shall be of such size and character as to be visible on a dark night with a clear atmosphere for a distance of at least 2 miles.

These rules shall be in full force and effect on and after September 1, 1914.

The penalty sections of the Act of Congress approved June 7, 1897, are quoted as follows:

"Sec. 3. That every pilot, engineer, mate, or master of any steam vessel, and every master or mate of any barge or canal boat, who neglects or refuses to observe the provisions of this Act, or the regulations established in pursuance of the preceding section, shall be liable to a penalty of fifty dollars, and for all damages sustained by any passenger in his person or baggage by such neglect or refusal: Provided, That nothing herein shall relieve any vessel, owner or corporation from any liability incurred by reason of such neglect or refusal.

"Sec. 4. That every vessel that shall be navigated without complying with the provisions of this Act shall be liable to a penalty of two hundred dollars, one-half to go to the informer, for which sum the vessel so navigated shall be liable and may be seized and proceeded against by action in any district court of the United States having jurisdiction of the offense."

The local inspectors addressed are requested to distribute this circular letter, within their respective districts, as far as practicable, as follows:

One copy to each master, mate, pilot and joint pilot and engineer of steam vessels; and to each operator of motor boats, now holding license and hereafter receiving license; one copy to the master or owner of each dredge of any type or of a vessel of any kind engaged in the business of working on wrecks; two copies to each motor boat of less than 10 gross tons, and one copy with each copy of Form 804, pamphlet pilot rules for the inland waters of the Atlantic and Pacific coasts, and of the coast of the Gulf of Mexico, until a supply of Form 804 amended to contain the new rules contained herein shall have been received by you.

Except that this circular letter shall not be generally furnished to officers and vessels navigating only rivers whose waters flow into the Gulf of Mexico.

A supply of this circular letter will be sent to chief officers of customs on the seaboard, who are requested to co-operate with the local inspectors in the distribution of the circular letter, but they should not send it to motor boats on lists of addresses of motor boat owners furnished by them to local inspectors.

A further supply of this circular letter can be obtained on requisition when needed.

GEORGE UHLER,
Supervising Inspector General.

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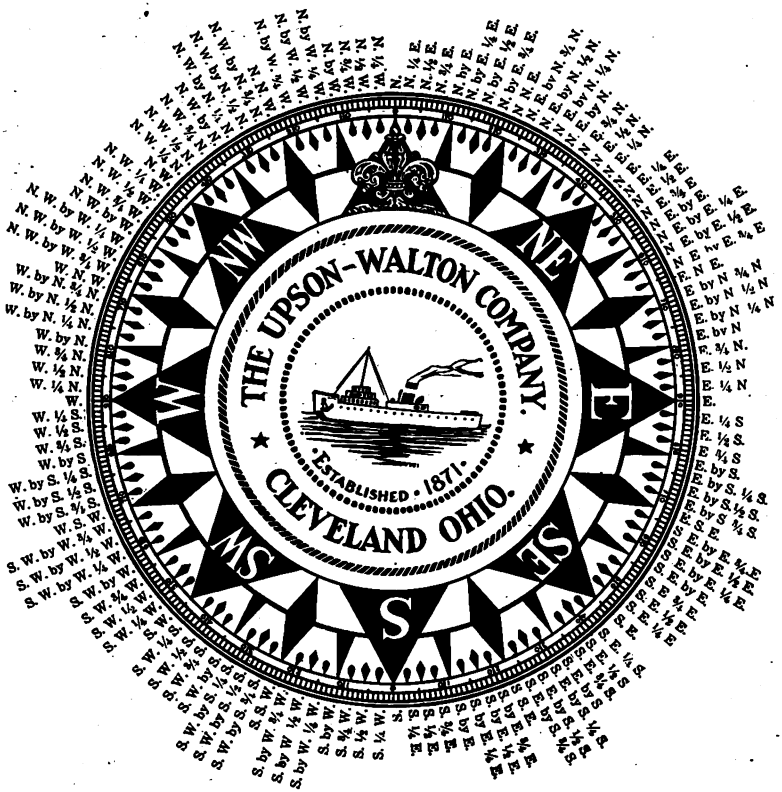
THE MARINER'S COMPASS



The Mariner's Compass is an instrument consisting either of a single magnet, or, more usually, of a group of magnets, which being attached to a graduated circle pivoted at the center and allowed to swing freely in a horizontal plane, has a tendency, when not affected by disturbing magnetic features within the ship, to lie with its magnetic axis in the plane of the earth's magnetic meridian, thus affording a means of determining the azimuth, or horizontal angular distance from that meridian, of the ship's course and of all visible objects, terrestrial or celestial.

The circular card of the compass is divided on its periphery into 360°, frequently numbered from 0° at North and South to 90° at East and West; also into 32 divisions of 11¼° each, called points, the latter being further divided into half-points and quarter-points; still finer subdivisions, eighth-points, are sometimes used, though not indicated on the card. A system of numbering the degrees from 0° to 360°, always increasing toward the right, is in use in the United States Navy and by the mariners of some foreign nations, and its general adoption would carry with it certain undoubted advantages.

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THE MARINER'S COMPASS—CONTINUED

Boxing the Compass is the process of naming the points in their order, and is one of the first things to be learned by the young mariner. The four principal points are called Cardinal points and are named North, South, East and West; each differs in direction from the adjacent one by 90°, or 8 points. Midway between the cardinal points, at an angular distance of 45°, or 4 points are the inter-cardinal points, named acording to their position Northeast, Southeast, etc. Midway between each cardinal and inter-cardinal point, at an angular distance of 22½°, or two points, is a point whose name is made up of a combination of that of the cardinal with that of the inter-cardinal point: North-Northeast, East-Northeast, East-Southeast, etc. At an angular distance of 1 point, or 11¼°, from each cardinal and inter-cardinal point (and therefore midway between it and the 22½° division last described), is a point which bears the name of that cardinal or inter-cardinal point joined by the word "by" to that of the cardinal point in the direction of which it lies: North by East, Northeast by North, Northeast by East, etc.

In boxing by fractional points, it is evident that each division may be referred to either of the whole points to which it is adjacent; for instance, N.E. by N. ½ N. and NNE. ½ E. would describe the same division. It is the custom in the United States Navy to box from North and South toward East and West, excepting that divisions adjacent to a cardinal or inter-cardinal point are always referred to that point; as N. ½ E., N. by E. ½ E., NNE. ½ E., NE. ½ N., etc. Some mariners, however, make it a practice to box from each cardinal and inter-cardinal point toward a 22½°-point (NNE., ENE., etc.); as N. ½ E., N. by E. ½ E., NE. by N. ½ N., NE. ½ N., etc.

The compass card is mounted in a bowl which is carried in gimbals, thus enabling the card to retain a horizontal position while the ship is pitching and rolling. A vertical black line called the lubber's line is marked on the inner surface of the bowl, and the compass is so mounted that a line joining its pivot with the lubber's line is parallel to the keel line of the vessel; thus the lubber's line always indicates the compass direction of the ship's head.

According to the purpose which it is designed to fulfill, a compass is designated as a Standard, Steering, Check, or Boat Compass. On United States Naval vessels additional compasses are designated as follows: Maneuvering, battle, auxiliary battle, top, and conning-tower compasses.

There are two types of magnetic compasses in use, the liquid or wet and the dry; in the former the bowl is filled with liquid, the card being thus partially buoyed with consequent increased ease of working on the pivot, and the liquid further serving to decrease the vibrations of the card when deflected by reason of the motion of the vessel or other cause. On account of its advantages the liquid compass is used in the United States Navy.

The Navy Service 7½-inch Liquid Compass. This consists of a skeleton card 7½ inches in diameter, made of tinned brass, resting on a pivot in liquid, with provisions for two pairs of magnets symmetrically placed.

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THE MARINER'S COMPASS—CONTINUED

The magnet system of the card consists of four cylindrical bundles of steel wires; these wires are laid side by side and magnetized as a bundle between the poles of a powerful electro-magnet. They are afterwards placed in a cylindrical case sealed, and secured to the card. Steel wires made up into a bundle were adopted because they are more homogeneous, can be more perfectly tempered and for the same weight give greater magnetic power than a solid steel bar. Two of the magnets are placed parallel to the north and south diameter of the card, and on the chords of 15° (nearly) of a circle passing through their extremities. These magnets penetrate the air vessel, to which they are soldered, and are further secured to the bottom of the ring of the card. The other two magnets of the system are placed parallel to the longer magnets on the chords of 45° (nearly) of a circle passing through their extremities and are secured to the bottom of the ring of the card.

The card is of a curved annular type, the outer ring being convex on the upper and inner side, and is graduated to read to one-quarter point, a card circle being adjusted to its outer edge and divided to half degrees with legible figures at each 5°, for use in reading bearings by an azimuth circle or in laying the course to degrees.

The card is provided with a concentric, spheroidal air vessel, to buoy its own weight and that of the magnets, allowing a pressure of between 60 and 90 grains on the pivot at 60° F.; the weight of the card in air is 3,060 grains. The air vessel has within it a hollow cone, open at its lower end, and provided with the pivot bearing or cap, containing a sapphire, which rests upon the pivot and thus supports the card; the cap is provided with adjusting screws for accurately centering the card. The pivot is fastened to the center of the bottom of the bowl by a flanged plate and screws. Through this plate and the bottom of the bowl are two small holes which communicate with the expansion chamber and admit of a circulation of the liquid between it and the bowl. The pivot is of gun metal with an iridium cap.

The card is mounted in a bowl of cast bronze, the glass cover of which is closely packed with rubber, preventing the evaporation or leakage of the liquid, which entirely fills the bowl. This liquid is composed of 45 per cent pure alcohol and 55 per cent distilled water, and remains liquid below —10° F.

The lubber's line is a fine line drawn on an enameled plate on the inside of the bowl, the inner surface of the latter being covered with an insoluble white paint.

Beneath the bowl is a metallic self-adjusting expansion chamber of elastic metal, by means of which the bowl is kept constantly full without the show of bubbling or the development of undue pressure caused by the change in volume of the liquid due to changes of temperature.

The rim of the compass bowl is made rigid and its outer edge turned strictly to gauge to receive the azimuth circle.

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THE MARINER'S COMPASS—CONTINUED

The Dry Compass. The Lord Kelvin Compass, which may be regarded as the standard for the dry type, consists of a strong paper card with the central parts cut away and its outer edge stiffened by a thin aluminum ring. The pivot is fitted with an iridium point, upon which rests a small light aluminum boss fitted with a sapphire bearing. Radiating from this boss are 32 silk threads whose outer ends are made fast to the inner edge of the compass card, these threads sustain the weight of the suspended card, and as they possess some elasticity, tend to decrease the shocks due to motion.

Eight small steel wire needles, 3¼ to 2 inches long, are secured normally to two parallel silk threads, and are slung from the aluminum rim of the card by other silk threads which pass through eyes in the ends of the outer pair of needles. The needles are below the radial threads, thus keeping the center of gravity low.

The Gyro Compass. This compass, which has recently been developed, consists essentially of a rapidly spinning rotor, usually driven by a three-phase alternating current of electricity at a rate varying according to the type, from 8,000 to 21,000 revolutions per minute, and so suspended that it automatically places its axis approximately in the direction of the geographical meridian and permits of the reading of the heading of the ship unaffected by any magnetic influence from a graduated compass card like that in use on magnetic compasses. From the "Master Compass," which may be located in a compartment below, electrical connections are made to "repeating compasses" on the bridge, in the conning tower, or in the steering-engine room, so that the ship's true heading may be transmitted to any desired part of the vessel.

The action of the Gyro Compass, affected as it is by the earth's rotation under it, conforms to Foucault's general law that "a spinning body tends to swing around so as to place its axis parallel to the axis of any impressed forces, and so that its direction of rotation is the same as that of the impressed forces." Small corrections, depending upon the latitude, course, and speed can be readily computed for application to the gyro compass readings either mechanically or by reference to tables.

The Azimuth Circle. This is a necessary fitting for all compasses employed for taking bearings—that is, noting the directions—of either celestial or terrestrial objects. The instrument varies widely in its different forms; the essential features which all share, consist in (a) a pair of sight vanes, or equivalent device, at the extremities of the diameter of a circle that revolves concentrically with the compass bowl, the line of sight thus always passing through the vertical axis of the compass; and (b) a system, usually of mirrors and prisms, by which the point of the compass card cut by the vertical plane through the line of sight—in other words, the compass direction—is brought into the field of view of the person making the observation. In some circles for observing azimuths of the sun, advantage is taken of the brightness of that body to reflect a pencil of light upon the card in such a manner as to indicate the bearing; such an azimuth circle is used in the United States Navy.

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THE MARINER'S COMPASS—CONTINUED

The azimuth circle should be tested occasionally for accuracy. This can best be done by mounting a standard compass on a tripod in a nonmagnetic spot on shore, in a locality where the variation has been accurately determined. The observed compass bearing of the sun should, of course, be the same as the computed magnetic bearing at any instant, the difference between the two, if any, being equal to the error of the compass or, what is more likely, the error of the azimuth circle. Any doubt in the matter may be removed by the use of two or more compasses. It will be frequently found that the error of the azimuth circle varies with the sun's altitude; this is due to the fact that the axis of the mirror is not normal to the plane passing through the sun, the 5-sided prism, and the center of the mirror.

Binnacles. Compasses are mounted for use in stands known as Binnacles, of which there are two principal types,—the Compensating and the Noncompensating Binnacle, so designated according as they are or are not equipped with appliances by which the deviation of the compass, or error in its indications due to disturbing magnetic features within the ship, may be compensated.

Binnacles may be of wood or of some nonmagnetic metal; all contain a compass chamber within which the compass is suspended in its gimbal ring, the knife edges upon which it is suspended resting in V-shaped bearings; an appropriate method is supplied for centering the compass. A hood is provided for the protection of the compass and for lighting it at night. Binnacles must be rigidly secured to the deck of the vessel in such positon that the lubber's line of the compass gives true indications of the direction of the ship's head.

The position of the various binnacles on shipboard and the height at which they carry the compass must be chosen with regard to the purpose which the compass is to serve, having in mind the magnetic conditions of the ship.

Compensating binnacles contain the appliances for carrying the various correctors used in the compensation of the deviation of the compass. These consist of (a) a system of permanent magnets for semi-circular deviation, placed in a magnetic chamber lying immediately beneath the compass chamber, so arranged as to permit variation in the height and number of the magnets employed; (b) a pair of arms projecting horizontally from the compass chamber and supporting masses of soft iron for quadrantal deviation; (c) a central tube in the vertical axis of the binnacle for a permanent magnet used to correct the heeling error; and (d) an attachment, sometimes fitted, for securing a vertical soft-iron rod, or "Flinders bar," used in certain cases for correction of a part of the semi-circular deviation.

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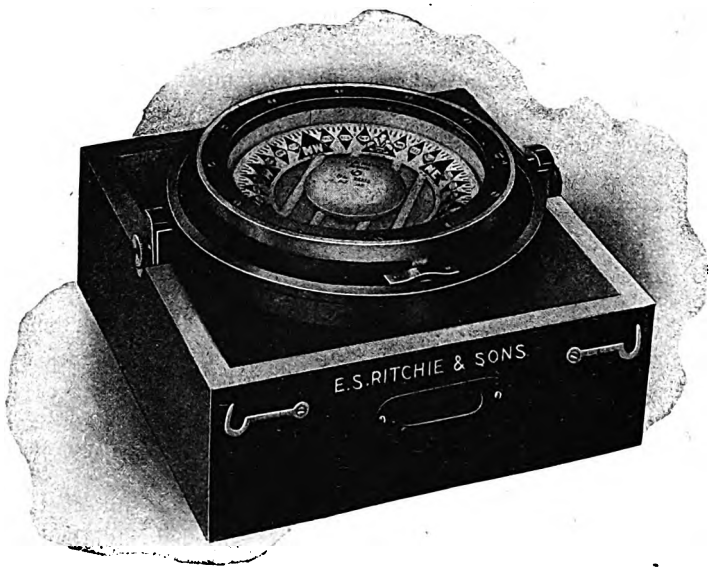
COMPASSES

UNITED STATES NAVY STANDARD



Curved inclined card with central buoy, four cylinders of needles. Divisions to quarter points on curved ring, lettered to points, circle graduated to degrees, figured to three degrees. Graduated from 0° to 360° or 0° to 90° in the four quadrants. Mahogany box is 13¾ inches square.

No. 2	In mahogany box	$75.50
No. 3	Without box	73.00
No. 4	In mahogany box with flat card graduated in degrees	75.50
No. 5	Flat card, without box	73.00

Curved Card Central Buoy Compass

Divisions are painted to quarter points and lettered to eight principal divisions. central buoy and parallel cylinders of six magnetic needles. Mahogany box, varnished.

No.	Size Card Inches	Outside Gimbal, In.	Box In. Sq.		Each
12	10	13½	16¼	with box	$66.50
13	10	13½	16¼	without box	62.50
14	8¾	12¼	13¾	with box	48.25
15	8¾	12¼	13¾	without box	44.75
16	7½	10¾	12	with box	40.00
17	7½	10¾	12	without box	37.00
18	6¾	9¾	11	with box	33.00
19	6¾	9¾	11	without box	30.50
20	5¼	8¾	9½	with box	31.75
21	5¼	8¾	9½	without box	29.75
22	4½	6½	8¼	with box	27.75
23	4½	6½	8¼	without box	26.25
24	4	6	7¼	with box	25.75
25	4	6	7¼	without box	24.00

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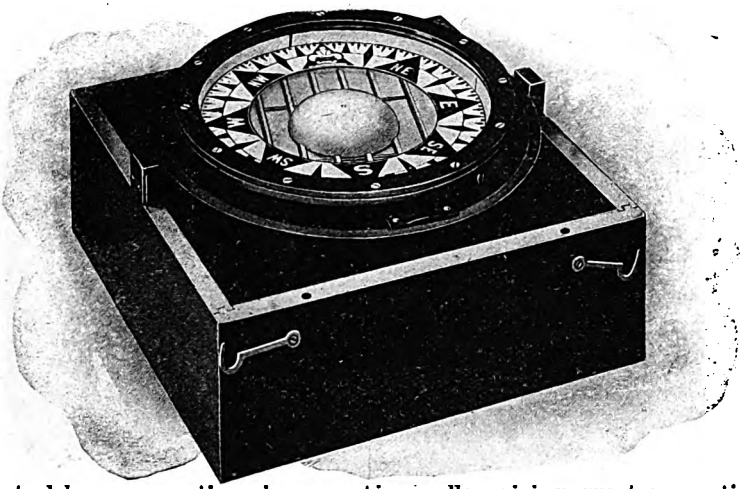
COMPASSES

FLAT CARD WITH CENTRAL BUOYANCY



Has central buoy supporting six magnetic needles giving great magnetic force and making the compass easier to adjust in iron ships. Divisions engraved to quarter points in Nos. 45 to 70, and eighth points in Nos. 40 to 44. A ring engraved to degrees with upright figures surrounds the card in the graduated compass. The degree card is supplied graduated 0° to 360° or 0° to 90° in the four quadrants.

No.		Size Card Inches	Outside Gimbal, In.	Box In. Sq.		Each
40	Graduated	11¾	15½	17½	without box	$72.00
41	Plain	10	13¼	15	with box	66.50
42	Plain	10	13¼	15	without box	62.50
43	Graduated	10	13¼	15	with box	66.50
44	Graduated	10	13¼	15	without box	62.50
45	Plain	8¾	12½	13¾	with box	48.25
46	Plain	8¾	12½	13¾	without box	44.75
47	Graduated	8¾	12½	13¾	with box	48.25
48	Graduated	8¾	12½	13¾	without box	44.75
49	Plain	7½	10¾	12	with box	40.00
50	Plain	7½	10¾	12	without box	37.00
51	Graduated	7½	10¾	12	with box	40.00
52	Graduated	7½	10¾	12	without box	37.00
53	Plain	6¾	9¾	11	with box	33.00
54	Plain	6¾	9¾	11	without box	30.50
55	Graduated	6¾	9¾	11	with box	33.00
56	Graduated	6¾	9¾	11	without box	30.50
57	Plain	5¼	8¾	9½	with box	31.00
58	Plain	5¼	8¾	9½	without box	29.75
59	Graduated	5¼	8¾	9½	with box	31.00
60	Graduated	5¼	8¾	9½	without box	29.75
61	Plain	4½	6¾	8¼	with box	27.75
62	Plain	4½	6¾	8¼	without box	26.25
63	Plain	4	6	7¼	with box	25.25
64	Plain	4	6	7¼	without box	24.00
65	Plain	3	5¼	6¾	with box	21.00
66	Plain	3	5¼	6¾	without box	20.00
67	Plain	2½	...	5¼	with box	14.00
68	Plain	2½	...	5¼	without box	13.50
69	Plain	2⅛	3½	4½	with box	10.00
70	Plain	2⅛	3½	4½	without box	9.50

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COMPASSES

DORY TYPE

Flat Card

The Ritchie Liquid Dory Compass is especially adapted for motor, sail and life boats. We manufacture this type in three sizes and recommend them when a diameter of card of not over three inches is desired. The dial is provided with the very best grade of sapphire jewel and is immersed in alcohol and water which eliminates vibration and makes the compass extremely sensitive. Our compasses are known throughout the world for their accuracy and reliability.

No. D65 Three in. flat, diameter of card 3⅛ in., mahogany box 6½ in. square, neck cover; card graduated in ¼ points and 0-360 degrees....$10.00

No. D66 Three in. flat, same as No. D65, marked in ½ points only..... 10.00

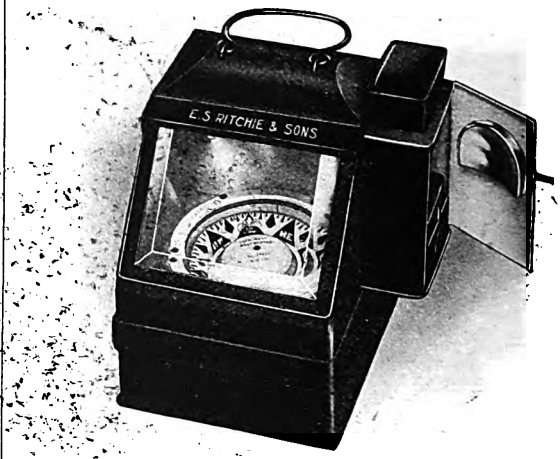
No. D67 Two and one-half in. flat, diameter of card 2½ in., box 5¼ in. square, neck cover; card graduated in ¼ points and 0-360 degrees.... 7.50

No. D68 Two and one-half in. flat, same as D67 marked in ½ points only 7.50

No. D69 Two in. flat, diameter of card 2⅛ in., box 4½ in. square, neck cover; card graduated in ¼ points and 0-360 degrees..... 5.00

No. D70 Two in. flat, same as D69 marked in ½ points only..... 5.00

BOAT COMPASS IN BINNACLE



Copper binnacle, 7 in. square and 10 in. high, with dome top and bale handle, beveled plate glass front, side lantern with lamp; the inside painted white, outside polished or japanned.

No. 110 Japanned, with compass No. 25 ..... $40.00

No. 111 Bright copper with compass No. 25 ..... 45.00

No. 112 Japanned with compass No. 64 ..... 40.00

No. 113 Bright copper with compass No. 64 ..... 45.00

Transparent Compass

The transparent compass has a card to read from above; bowl similar to double card compass with gimbal ring.

No. 90 Nine in., card 8¾ in..... $48.00

No. 91 Eight in., card 7½ in..... 45.00

No. 92 Seven in., card 6¾ in..... 40.00

Telltale Compass

Similar to transparent compass excepting that it has a single card to read from below.

No. 100 Nine in., card 8¾ in..... $52.00

No. 101 Eight in., card 7½ in..... 49.00

No. 102 Seven in., card 6¾ in..... 43.00

Supporting arm for attaching Nos. 90 to 102 to side of skylight or mast. $5.00

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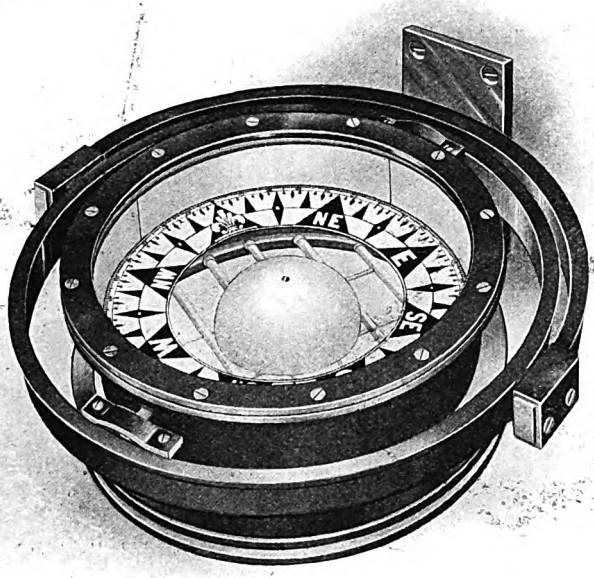
NAUTICAL INSTRUMENTS

DOUBLE CARD TRANSPARENT COMPASS



The compass bowl has a glass top and bottom; two cards, to read from above and from below, marked in quarter points and degrees.

No. 75 Nine in. card diameter 8¾ in., gimbal ring outside 12½ in.....$53.00
No. 76 Eight in. card diameter 7½ in., gimbal ring outside 11½ in..... 50.00
No. 77 Seven in. card diameter 6¾ in., gimbal ring outside 10¾ in..... 44.00

BINNACLE WITH MOVABLE TOP

Copper binnacle is 8¼ inches square, 14 inches high. The top can be removed when desired, when in place it is held by catches on either side. Has tubes for fore and aft and athwartship magnets, and 3½ inch soft iron balls for quadrantal error correction.

No. 114 Japanned copper, with No. 23 compass $53.00
No. 115 Japanned copper, with No. 62 compass 53.00

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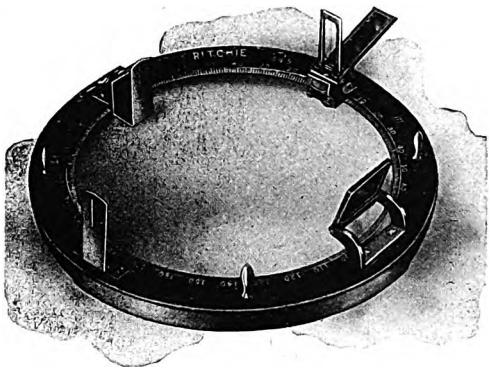
NAUTICAL INSTRUMENTS

UNITED STATES NAVY AZIMUTH CIRCLE

Fits Navy Standard Compass

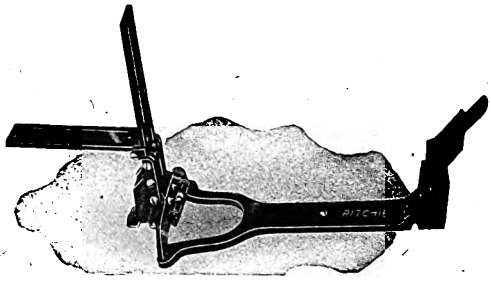


The ring carrying optical parts is turned to fit top of standard compass. Sun rays are received on cylindrical convex mirror, and reflected through a right angle prism on opposite side of ring to the cylindrical lens below, appearing on the card as a bright bar of light on the graduations. This can readily be seen when the sun is much obscured. At right angles to this are the usual sight vanes, hair line and reflector for dim sun observations or for taking bearings. The double arrangement enables the circle to be tested by comparing one reading with the other. Inner rim is graduated 0° to 360°.

No. 120 Complete, in mahogany box, $75.00

BAR AZIMUTH INSTRUMENT

For Merchant Service



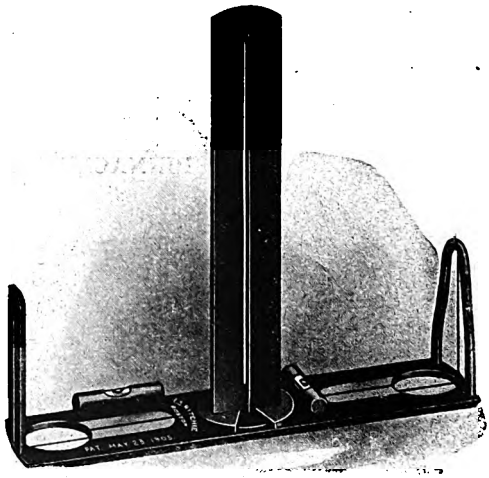
This instrument has the same general features as the navy circle except that it is swung from a pin fitting a hole in the center of the compass glass. It is fitted for sun or star observations, or for taking bearings.

No. 125 For 6, 7, 8, 9, 10 and 12 in. card compass, in mahogany box....$30.00

No. 126 Shadow pin, brass, mounted on base with pin for center of glass, 1.50

AZIMUTH BEARING INSTRUMENT

Type A



This instrument is swung from a pin fitted into a hole drilled in the center of the compass glass. Direct bearings may be taken of distant objects. A very low sun azimuth may be read with this instrument.

No. 127 For 6, 7, 8, 9, 10 and 12 in. card compass, in mahogany box...$15.00

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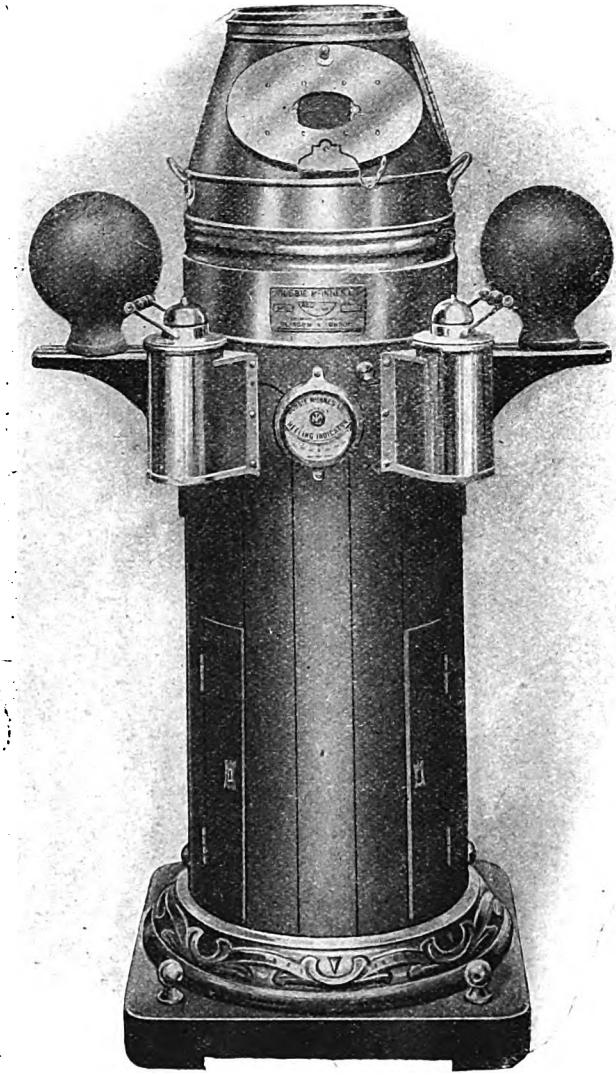
BINNACLES

DOBBIE McINNES STANDARD COMPASS

Latest Patent Merchant Service Pattern, 10 inch Dry Card Compass



Binnacle Model R

Lit from below by oil or electricity. Patent light regulator or dimmer for night use. Prices and complete specifications upon application.

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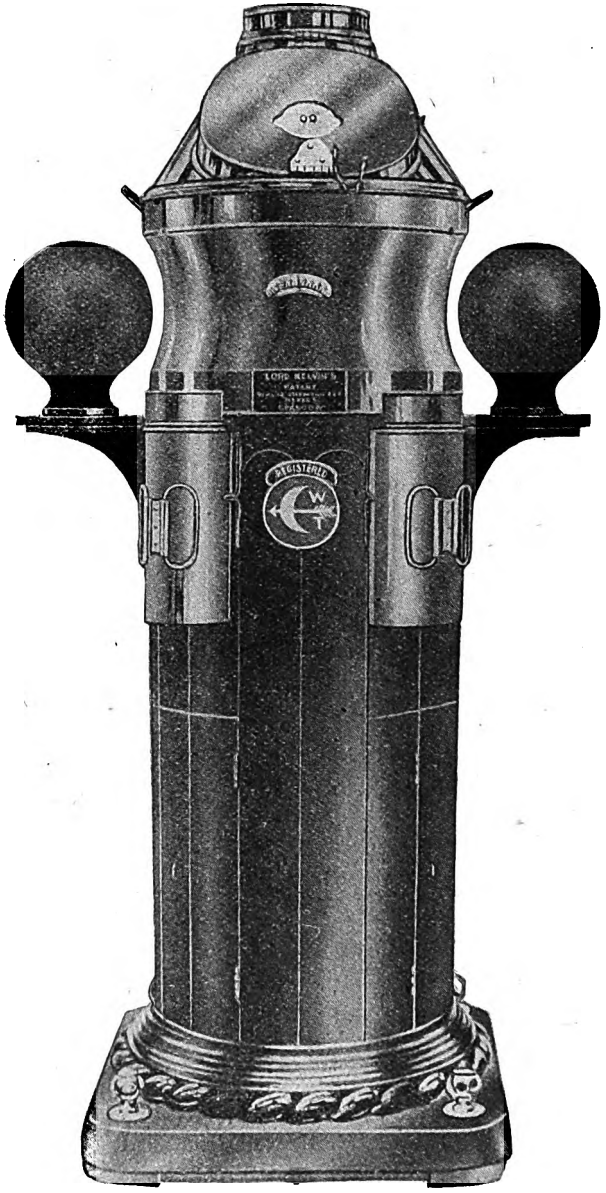
BINNACLES

LORD KELVIN'S PATENT



Compass and Binnacle Model F

With all latest improvements including 10 inch dry card compass.
Prices and complete specifications upon application.

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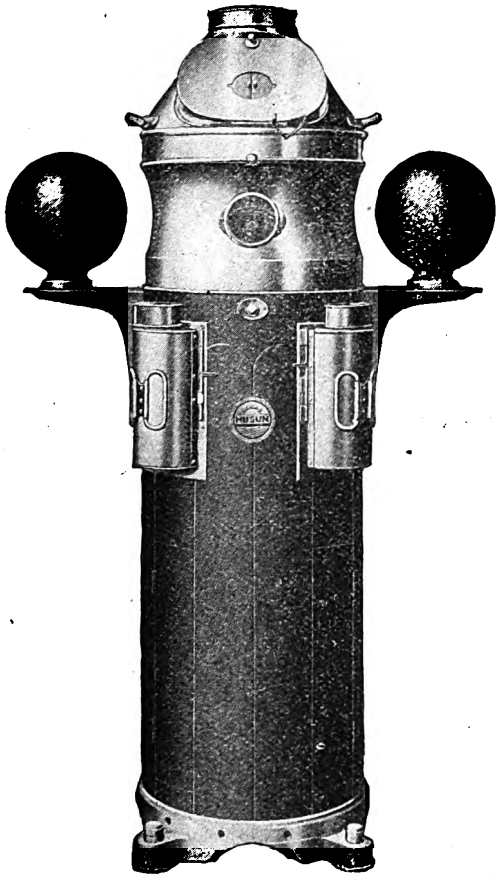
BINNACLES



STANDARD BINNACLE

Husun Type

Constructed with cone top and willow band of No. 20 S.W.G., brass mounted on circular teak stand, composed of 1½ in. finished teak staves, with circular metal base fitted with deck plates and bolts. The binnacle is provided with dual lighting for electricity or oil, and is fitted complete with correcting spheres, heeling and adjusting magnets, Flinders bar, clinometer, and all accessories. Complete with standard dry compass (as below), and azimuth mirror.

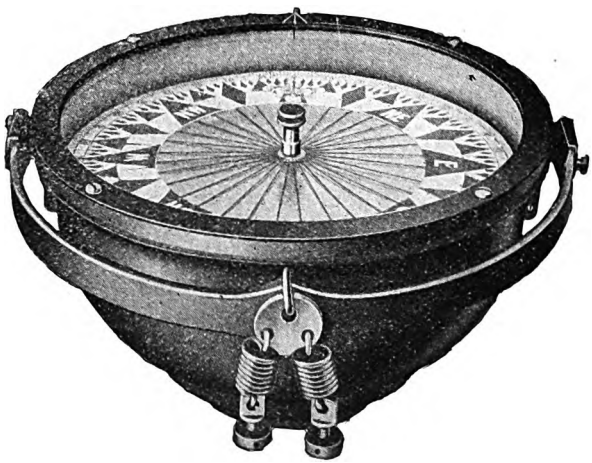
Prices upon application.

STANDARD DRY COMPASS

Thomson Type

Constructed with 10¾ in. dia. brass bowl with two chambers fitted with machined verge and gimbal rings and lateral springs, lighted from below through 5 in. dia. plain convex lens and oil ballast, complete with 10 in. dia. Thomson card and magnetic system.

Prices upon application.



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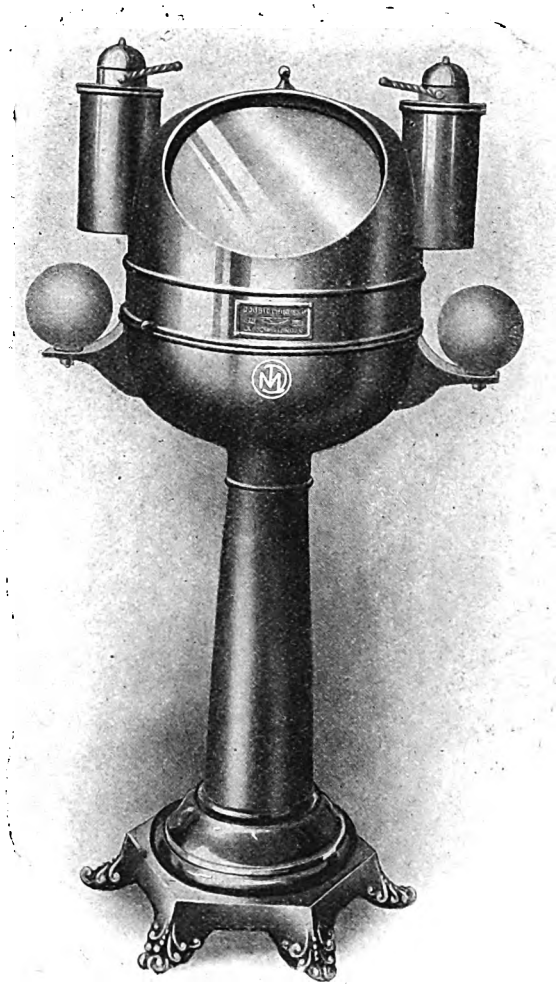
BINNACLES

BRIDGE AND AFTER COMPASS BINNACLE



Polished brass pillar stand with brass bowl and top; two lamp and chain boxes or iron balls with deck fittings.

Suitable for liquid compasses from 5 inches to 10 inches, inclusive.

Prices and complete specifications upon application.

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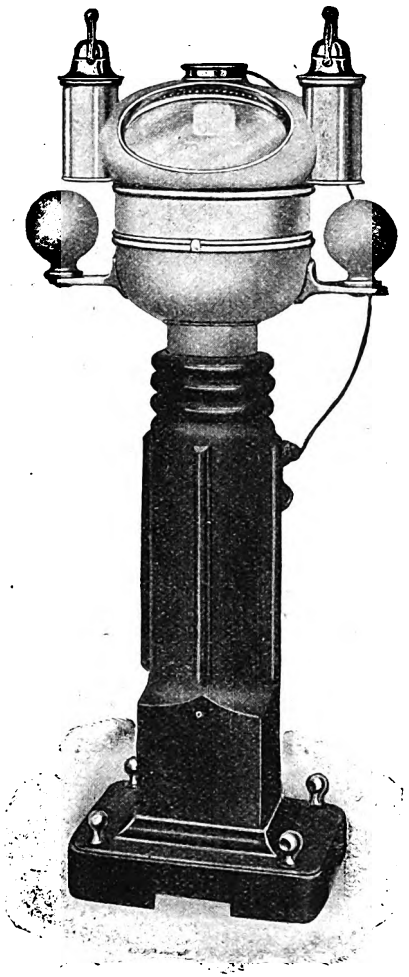
BINNACLES

BRIDGE AND STEERING COMPASS BINNACLE



Best polished teak pillar stand with brass bowl and top; two lamps and iron balls with deck fittings.

Can be furnished to take compasses from 5 inches to 12 inches, inclusive.

Prices and complete specifications upon application.

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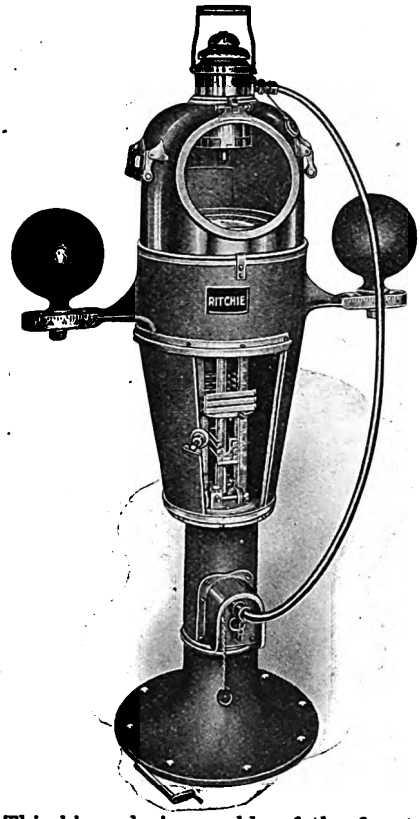
BINNACLES

UNITED STATES NAVY STANDARD



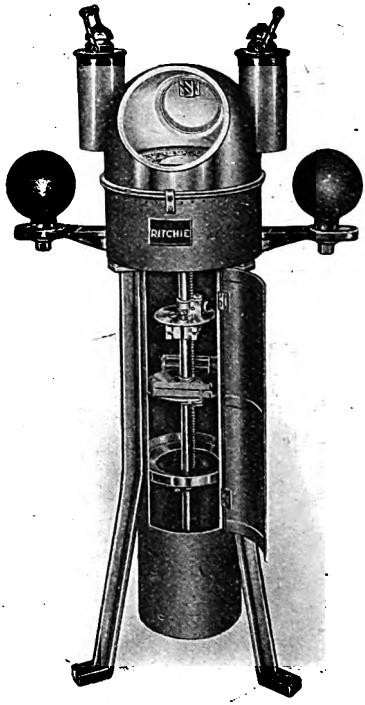
This binnacle is capable of the finest adjustment and at the same time will stand the hardest usage. It is made of gun metal in one casting and weighs, without the hood about 170 lbs. The magnet chamber is fitted with lock and key so that adjustments cannot be meddled with. Magnets are provided for heeling fore and aft and athwart ship adjustments and twelve magnets are furnished for sem-circular deviation. Binnacle is permanently fitted for both oil and electric illumination.

Height 41 in., width across arms 33 in., diam. base 15 in., diam. compass chamber 12¾ in.

No. 135 With 7 in. balls for quadrantal correction $400.00

RITCHIE COMPENSATING

For Fore and Aft and Athwartship Adjustment



This binnacle is all metal and is used with 7 inch graduated card compass. It is supported on three gun metal legs and the magnet case is closed by a long door fitted with locks top and bottom. The hood has a glass door in the after side and a hinged one forward and is painted white inside and bright outside. Magnets are provided for heeling, fore and aft and athwartship adjustments. Fitted with two oil lamps.

Height 46 in., width across arms 26 in., diameter compass chamber 11 in.

No. 136 Complete with 7 in. card compass and 5 in. balls for quadrantal correction $175.00

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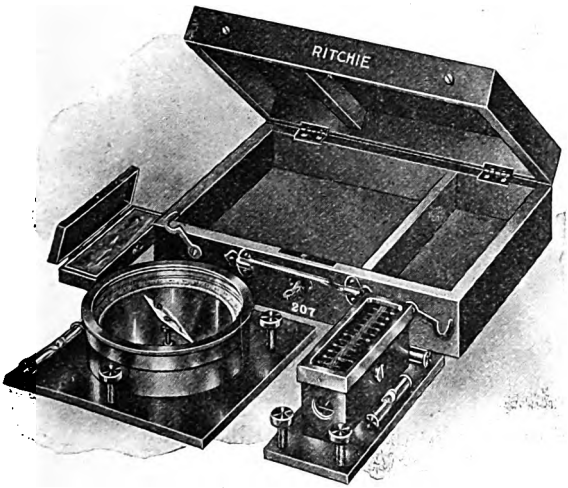
NAUTICAL INSTRUMENTS

MAGNETIC HORIZONTAL AND VERTICAL FORCE INSTRUMENTS

For Compass Adjustment
As Made for the U. S. Navy



Horizontal Force Instrument

An accurately balanced magnetic needle, 3 inches long, with a sliding balanced weight mounted inside a brass case with graduated ring. The base is provided with spirit level and leveling screws. The needle is hung on a sapphire jewel.

Vertical Force Instrument

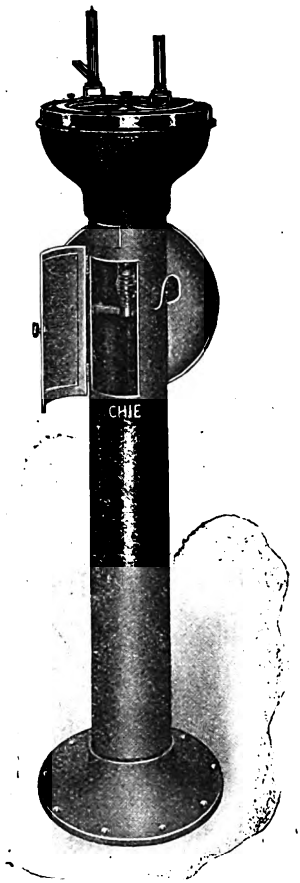
A horizontal needle with sliding weight is mounted on steel knife edges with agate bearings, enclosed in brass case which is mounted on a brass base. The base is provided with two levels and leveling screws. Bottom of the case is silvered and graduated. A similar graduation is etched on the glass cover, and the position of the sliding weight can be accurately measured without error from parallax.

No. 140 Horizontal and vertical instruments complete in mahogany case with lock and key.....$90.00

Elevating Table

No. 141 A rod fitting center tube of binnacle supports a table 6 in. in diameter, which can be placed at proper elevation for vertical or horizontal force instrument.....$3.50

ILLUMINATED DIAL PELORUS



This pelorus as shown is furnished to the U. S. Navy and is a very complete instrument. The dial is thick plate glass with black lettering marked in points and degrees. The alidade is the standard form with sight vanes and black glass. The special feature of this instrument is the underlight electric lamp placed below the pelorus bowl inside the standard. Light is reflected upward and the glass dial is clearly read at night without using the navigator's auxiliary lantern. Light is controlled by a small switch.

Diameter of dial 8½ in., total height 52 in.

No. 145 With pelorus and alidade, packed in mahogany box, complete with electric attachment $200.00

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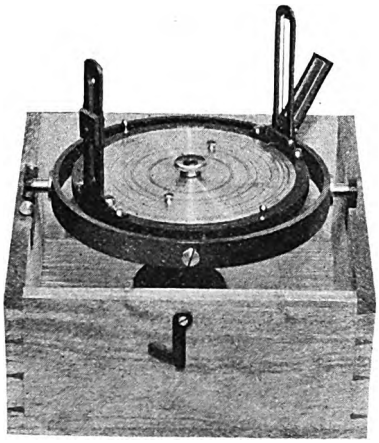
NAUTICAL INSTRUMENTS

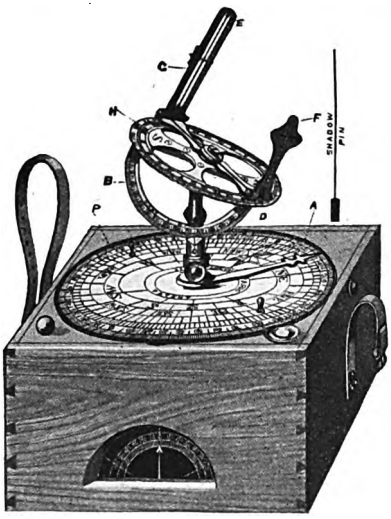
EUCLID PELORUS



Manufactured in response to a demand for a reversible double dial pelorus. Dial engraved "right" on one side, "left" on the other; easily and quickly reversed.

In mahogany case.....each, $....

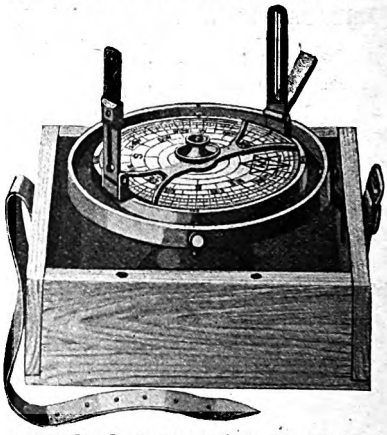
HEATH'S LONDON POLARIS



Improved model with balanced sights, enabling suns bearing to be taken at any altitude.

In mahogany case.....each, $....

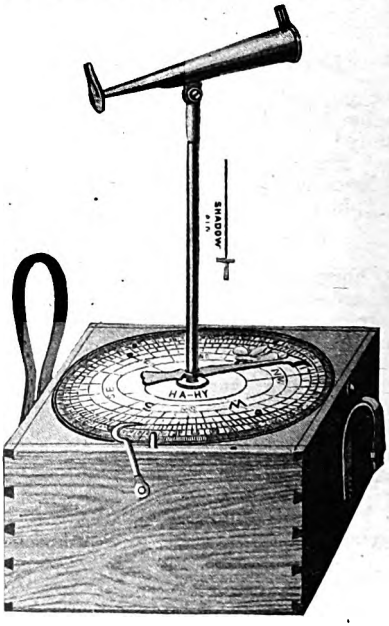
ADMIRAL FRIEND'S PELORUS



The standard construction, more generally used than any other form of pelorus.

In mahogany case.....each, $....

HA-HY COURSE CORRECTOR



New patent dial with inner variation degrees on the circle, conical sight tube and vane, folding sight tube.

In mahogany case.....$....

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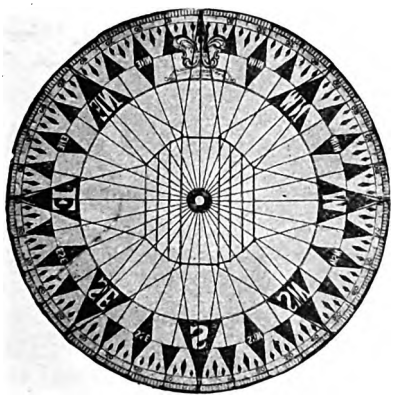
NAUTICAL INSTRUMENTS

DRY CARD COMPASSES

These cards have light aluminum rims with either 6 or 8 needles, sapphire cap and iridium point, complete in boxes; weight 204 grains. Period about 36 seconds.

Each .....$....
With Kew certificate.....extra, $2.50

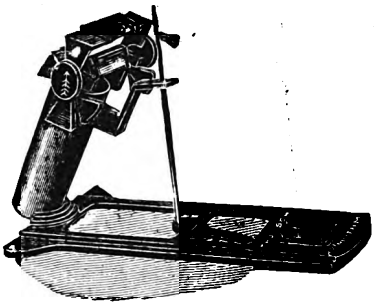
PRESSED RING COMPASS CARDS



Ten inch diameter with crystal iridium point, aluminum and sapphire cap, Kew certificate.

For light above.....each, $....
For light below.....each, ...

THOMPSON MODEL AZIMUTH INSTRUMENT



Complete in mahogany case
For 10 inch compass.....each, $....
For 12 inch compass.....each, ...

MAGNETS

Bar Magnets, Copper Covered

Size, in.....	6	9	12	15	18	21	24
Per dozen...$...	...	...	...	...	...	...	...

Uncovered Bar Magnets.....per lb., $....
Round Magnets, red and blue, all sizes for all types of binnacles..per doz., ...

COMPASS NEEDLES

Needles for single needle compasses, sizes 3 to 9 inches.....per dozen, $....

Needles for double needle compasses, sizes 3 to 9 inches.....per dozen, ...

Needle for edge bar compasses, sizes 3 to 9 inches.....per dozen, ...

AZIMUTH CIRCLES

Made of glass, to fit on top of compass glass; graduated points 0 to 360 degrees carried in stock.

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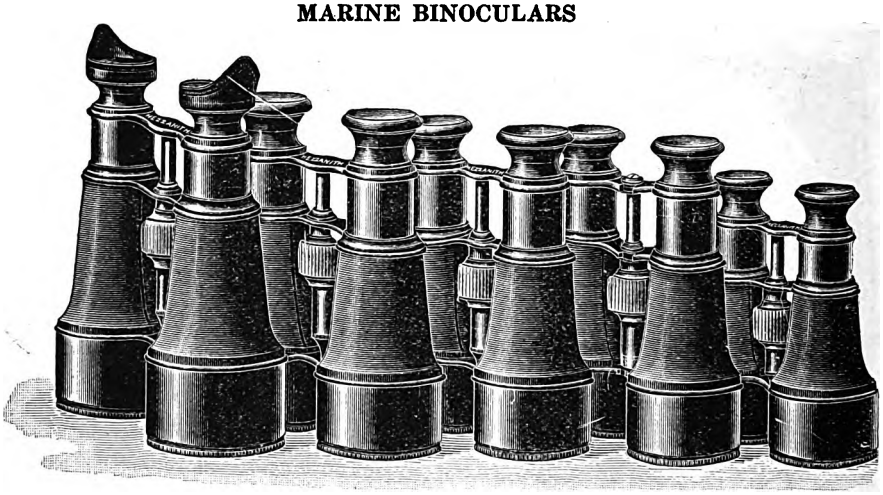
MARINE BINOCULARS AND TELESCOPES

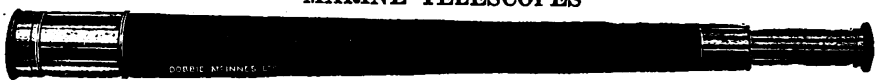
MARINE BINOCULARS



Black or buff leather covered, in sling case

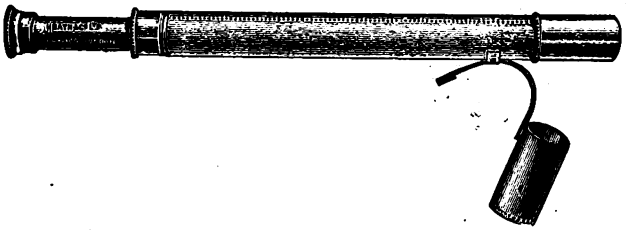
Nos.	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111
Lens	6	12	6	12	6	12	6	12	6	12	6	12
Lines	28	28	26	26	24	24	21	21	19	19	17	17
Diam., in.	2⅜	2⅜	2¼	2¼	2⅛	2⅛	1⅞	1⅞	1⅝	1⅝	1½	1½
Each $	....	....	....	....	....	....	....	....	....	....	....	....

MARINE TELESCOPES



Admiralty pattern, taper body, black morocco covered, polished brass fittings, object glass 2⅛ in. diameter, length closed 28 in. .....each, $....

Day and night, straight body, black morocco covered, polished brass fittings, object glass 2¼ in. diameter, length closed 21 in. .....each, $....



Officer of the watch, white metal telescope buff leather covered body and cap, power 16 diameters, length closed 18 in., open 24 in. .....each, $....

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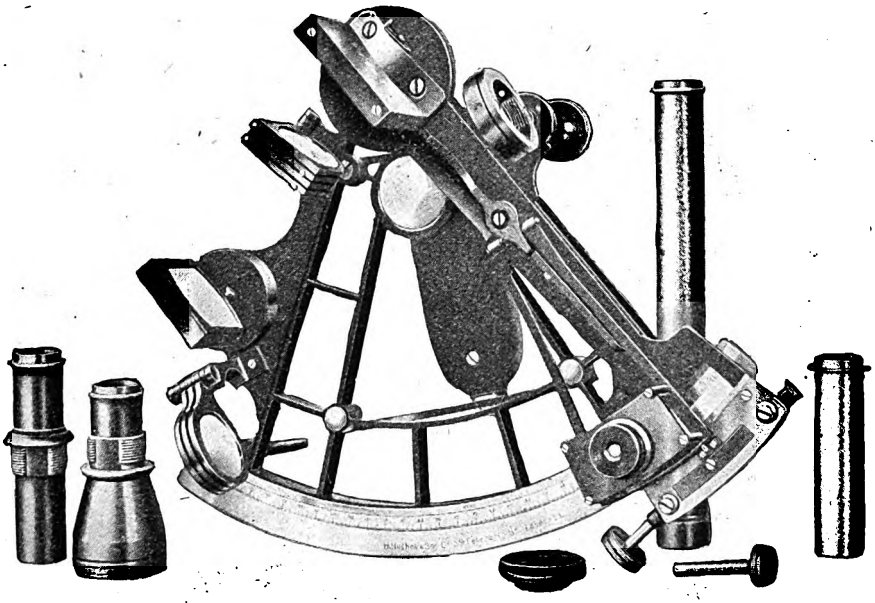
SEXTANTS

THE CHRONO SEXTANT



This improved form of sextant has been designed to meet the requirements of modern star navigation. The limb is of a new registered design, with a fitting for a small chronograph, hence its name. Its optical elements, comprising the mirrors, shades, and telescopes are all of the highest quality. In its complete form it is fitted, as shown here, with an inside secondary arch, divided in half degrees, and a recording pencil for marking shore angles. It is of the best construction and highest finish. Made in two sizes, 8 in. and 7 in. respectively, packed in a handsome brass bound mahogany case polished inside and out, with patent lock and handle. Silver arch and vernier reading to 10″, with best spring tangent screw, improved magnifier and refractor, large stellar index and horizon mirrors, neutral shades. Set of high grade telescopes, comprising inverting telescope with two powers, Prospect telescope, Star telescope two powers with wheel, shadehead, adjusting screw, screwdriver, Class A certificate from the National Physical Laboratory and chronograph complete.

Weight of sextant, complete in case.....3½ lbs.
Outside measure of case.....11½x11x5½

The above is only one of the many different types of sextants which we carry in stock at all times in all sizes to meet the requirements of the practical navigator and deliveries can be made from either Cleveland or New York stocks at short notice.

All instruments furnished with or without Class A certificates as desired.

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MARINE CHRONOMETERS

These chronometers are of the best construction and highest finish, with all latest improvements, Grade A being specially selected and finished chronometers of the very highest class. A three years' guarantee is given with each, and, if not approved, it will be exchanged free of charge. They are delivered by us free on board ship at any port in the United States or Canada.

Good second hand chronometers always on hand. All chronometers furnished with or without special auxiliary compensation.

Prices (including guard boxes) on appli cation.

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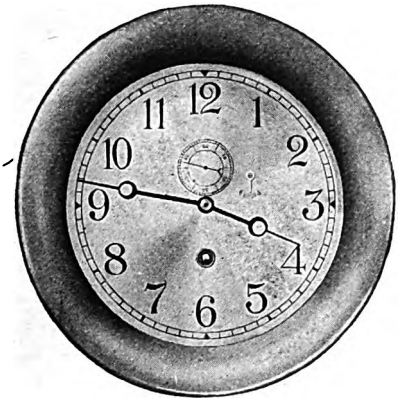
CLOCKS AND CHRONOGRAPHS

CHELSEA CLOCKS



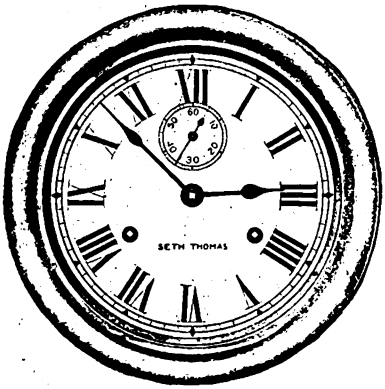
Non-Striking, Screw Bezel Cases

No. 140	4½ in. dial	each,	$27.00
No. 141	6 in. dial	each,	30.00

Non-Striking, Hinged Bezel Cases With Lock and Key

No. 142	4½ in.	each,	$31.00
No. 143	6 in.	each,	34.00
No. 143½	6¾ in.	each,	40.00
No. 144	8½ in.	each,	43.00
No. 145	10 in.	each,	55.00
No. 146	12 in.	each,	62.00

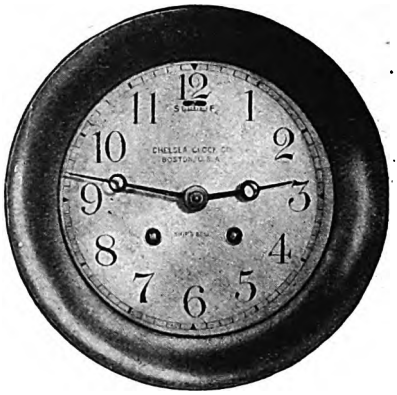
SETH THOMAS CLOCKS



Non-striking 8 day engine lever, etched silvered dial, ringed bezel.

6 in. dial, brass case.....each, $....
6 in. dial, nickel case.....each, ...

CHELSEA SHIP'S BELL CLOCKS



Strikes eight bells every 4 hours.

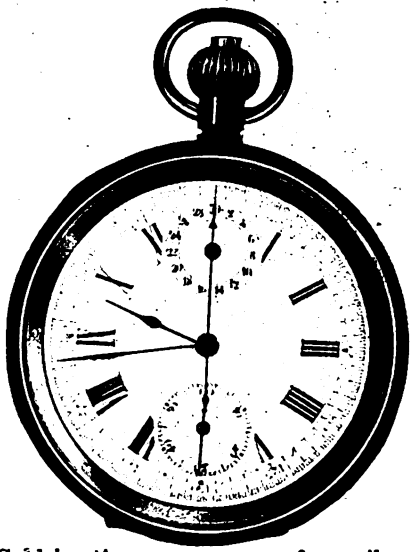
Screw Bezel Cases

No. 100	4½ in. dial	each,	$55.00
No. 101	6 in. dial	each,	61.00

Hinged Bezel Cases

No. 102	4½ in. dial	each,	$59.00
No. 103	6 in. dial	each,	65.00
No. 103½	6¾ in. dial	each,	69.00
No. 104	8½ in. dial	each,	72.00
No. 105	10 in. dial	each,	78.00
No. 106	12 in. dial	each,	85.00

DOBBIE CHRONOGRAPH



Gold hunting case or open face, silver or oxydized open face. Non-magnetic.
7 to 17 jewels.....price on application

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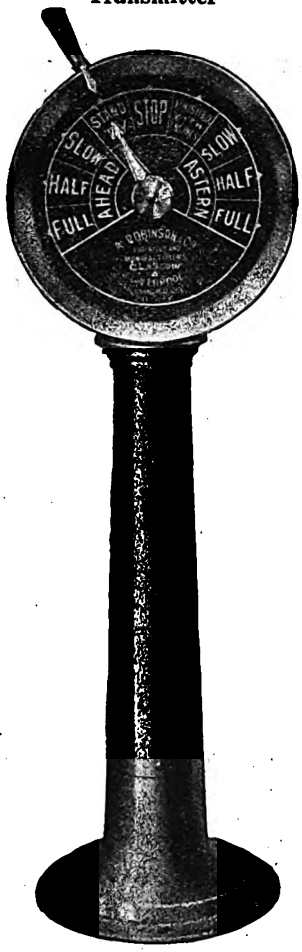
SINGLE DIAL ENGINE ROOM TELEGRAPH

Transmitter



Indicator

TRANSMITTERS

These instruments are made in the undermentioned standard sizes, either of the "Reply" or "Non-Reply" type, and with Automatic Engine Direction Telltale Pointer if required:

Visible diam. dial, in.....	6	7	8	9	10	11
Diam. over rim, in.....	7½	8½	9½	10½	11½	12½
Ht., base to top of head, in.	28	30	39	42	43	45
Visible diam. dial, in.....	12	14	16	18	20	
Diam. over rim, in.....	14	16	18½	20½	23	
Ht., base to top of head, in....	46	46	46	46	46	

and to the following specifications:

(a) All of polished brass with oil lamp, combined oil and electric lamp, or both oil and electric lamps.

(b) Polished brass head on cast iron pillar.

(c) Cast iron head and pillar, with brass front rim and brass lever and handle.

INDICATORS

The following are standard sizes of these instruments:

Visible diameter of dial, inches.....	9	11	12	14	16	18	22	24
Diameter over rim, inches.....	11	13	14	16	18	20	24	27

which are of the "Reply" or "None-Reply" type, fitted with loud-sounding gong. When required, they are made with Duplex Gongs. having a deep tone for "Ahead," and a shrill tone for "Astern" orders, and also with Automatic Reply Pointer actuated from the weigh shaft.

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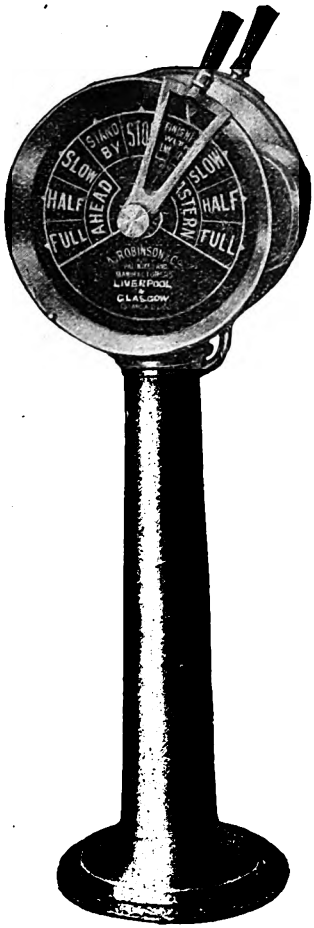
DOUBLE DIAL REPLY TELEGRAPH

For Single Screw Steamers

Transmitter



Indicator

TRANSMITTERS

These instruments are made in the undermentioned standard sizes, either of the "Reply" or "Non-Reply" type, and with Automatic Engine Direction Telltale Pointer if required:

Visible diam. dial, in.....	6	7	8	9	10	11
Diam. over rim, in.....	7½	8½	9½	10½	11½	12½
Ht., base to top of head, in.	28	30	39	42	43	45
Visible diam dial, in.....	12	14	16	18	20	
Diam. over rim, in.....	14	16	18½	20½	23	
Ht., base to top of head, in....	46	46	46	46	46	

and to the following specifications:

(a) All of polished brass with oil lamp, combined oil and electric lamp, or both oil and electric lamps.

(b) Polished brass head on cast iron pillar.

(c) Cast iron head and pillar, with brass front rim and brass lever and handle.

INDICATORS

The following are standard sizes of these instruments:

Visible diameter of dial, inches.....	9	11	12	14	16	18	22	24
Diameter over rim, inches.....	11	13	14	16	18	20	24	27

which are of the "Reply" or "Non-Reply" type, fitted with loud-sounding gong. When required, they are made with Duplex Gongs, having a deep tone for "Ahead," and a shrill tone for "Astern" orders, and also with Automatic Reply Pointer actuated from the weigh shaft.

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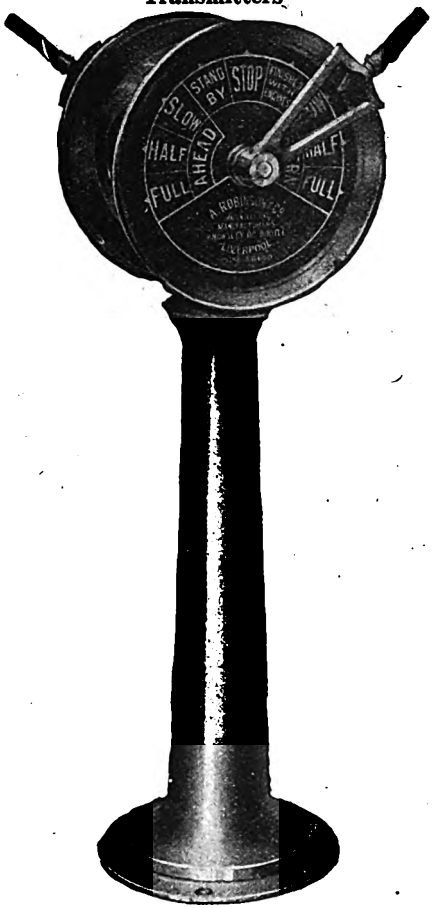
REPLY TWIN ENGINE TELEGRAPH

For Twin Screw Steamers

Transmitters



TRANSMITTERS

These instruments are made in the undermentioned standard sizes, either of the "Reply" or "Non-Reply" type, and with Automatic Engine Direction Telltale Pointer if required:

Visible Diameter of Dial, Inches	Diameter over Rim, Inches	Height from Base to Top of Head, Inches
6	7½	28
7	8½	30
8	9½	39
9	10½	42
10	11½	43
11	12½	45
12	14	46
14	16	46
16	18½	46
18	20½	46
20	23	46

and to the following specifications:

(a) All of polished brass with oil lamp, combined oil and electric lamp, or both oil and electric lamps.

(b) Polished brass head on cast iron pillar.

(c) Cast iron head and pillar, with brass front rim and brass lever and handle.

INDICATORS

Standard sizes of these instruments:

Visible Diam. of Dial, Inches	Diam. over Rim, Inches	Visible Diam. of Dial, Inches	Diam. over Rim, Inches
9	11	16	18
11	13	18	20
12	14	22	24
14	16	24	27

which are of the "Reply" or "Non-Reply" type, fitted with loud-sounding gong. When required, they are made with Duplex Gongs, having a deep tone for "Ahead," and a shrill tone for "Astern" orders, and also with Automatic Reply Pointer actuated from the weigh shaft.

Indicators

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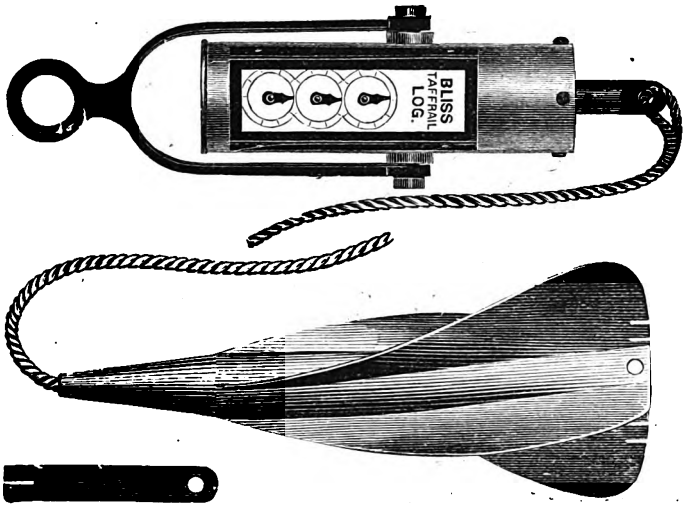
SHIPS' LOGS

BLISS TAFFRAIL LOG

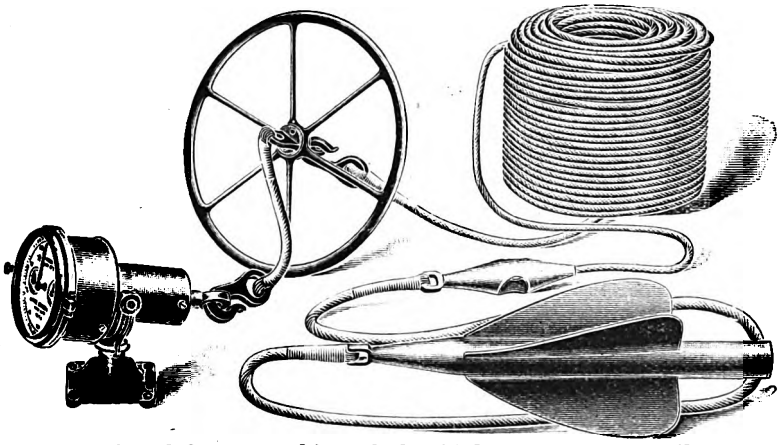


With adjustable rotator for sailing vessels and steamers of moderate speed.

No. 320 Log complete, with one rotator, 200 feet braided line, one brass hook and one wrench, in box with instructions $22.00

No. 321	Extra rotator	$4.00	No. 323	Extra hook	$0.10
No. 322	Extra line 200 ft.	2.00	No. 324	Extra wrench	.10

BLISS DOUBLE STAR LOG



This log is designed for steamships of the highest speed as well as for moderate speed. The entire strain of the towing line is sustained on steel balls in hardened steel raceways. The dial indicates distances by tenths up to 1000 nautical miles.

No. 311 Log complete, with two shoes, one rotator wheel governor, one hook and 300 feet braided line, in box with instructions $30.00

No. 312	Extra rotator	$6.00	No. 315	Extra line 400 ft.	$6.00
No. 313	Extra wheel governor	2.50	No. 316	Extra hook	.50
No. 314	Extra line 300 ft.	4.50	No. 317	Extra shoe	1.00

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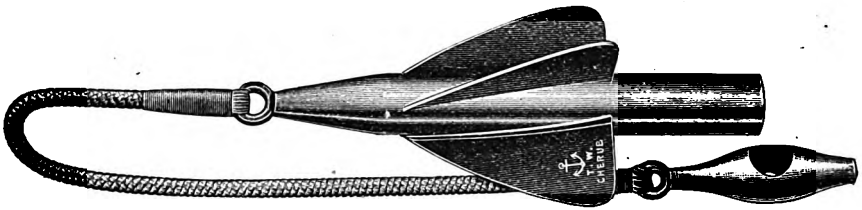
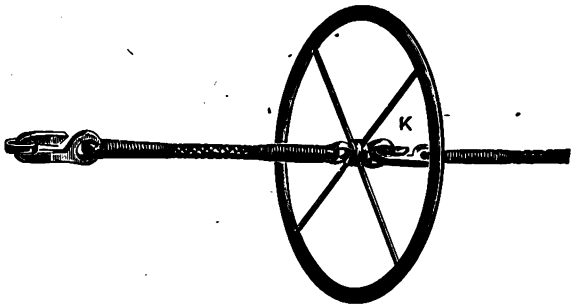
SHIPS' LOGS

WALKER'S CHERUB LOG

Mark II





This is a very accurate and serviceable log. Its construction is exceptionally strong, the working parts being of hardened steel and phosphor bronze, recommended for speeds up to 14 knots.

Ball bearings, complete with rotator, wheel governor, 300 ft. braided line, hook, 2 shoes and 3 extra glasses	$....
Extra rotator	6.00
Extra governor	2.00
Extra line 300 ft.	4.50
Extra hook	.50
Extra shoe	1.50

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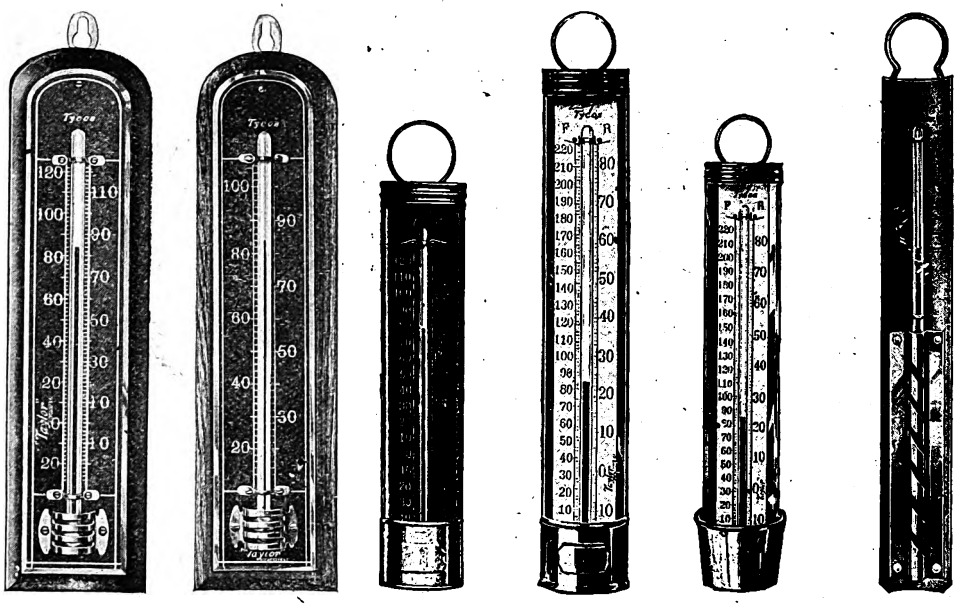
THERMOMETERS

No. 5100 No. 5101 5400P, 5400K No. 5804 No. 5808 No. 5970



No. 5100 Outdoor range, 10° to 40° below zero to 120° above, Fahrenheit scale.

Length, inches		6	8	10	12
Black scale, wood back	per doz.,	$12.00	15.00	19.50	27.00

No. 5101 Indoor range, 20° to 100° above zero, Fahrenheit scale.

Length, inches		6	8	10	12
Black scale, wood back	per doz.,	$12.00	15.00	19.50	27.00

No. 5400P Air temperature, 10° to 40° below zero to 120° F. above.

Length, inches			8	10	12
Copper case, oxidized brass scale	per doz.,		$14.00	18.00	22.00
No. 5400K Copper cup case	per doz.,		....	22.00	27.00

No. 5804 Range 0° to 220° above zero, Fahrenheit and Reaumur scales.

Length, in.		10	12
Copper case, silvered brass scale	per doz.,	$18.00	22.00
No. 5808 Copper cup case	per doz.,	22.00	27.00

No. 5970 Marine thermometer, 8½ in. silvered scale, with hook on back, mercury tube, cylinder bulb, approximate scale 130° to 230° F. .....per doz., $18.00

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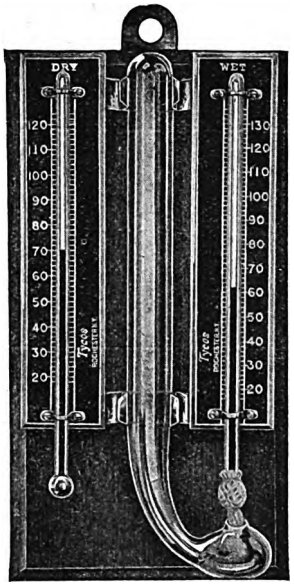
NAUTICAL INSTRUMENTS

HYGROMETERS

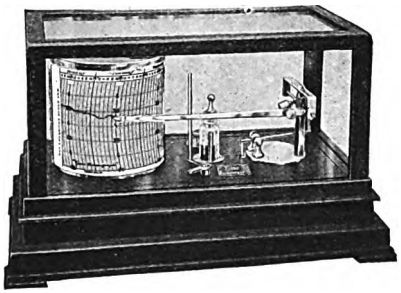
Weather Bureau Pattern



No. 553 Two thermometers, with certificates, mounted on mahogany finish board 17x5 in., one connected by silk wick with nickel plated brass cistern .....each, $11.00

The thermometers have engraved mercury tubes, cylindrical bulbs, mounted on aluminum scale, on which are marked the figures every 10 degrees. Range 10° to 40° below zero to 120° above.

BAROGRAPHS

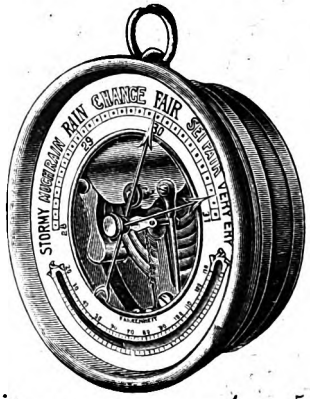


This instrument gives a continuous record of atmospheric conditions.

No. 818 Mahogany case with thermometer .....each, $....

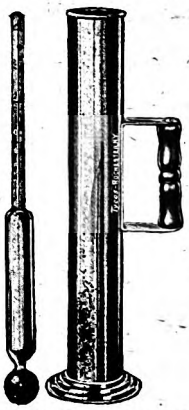
ANEROID BAROMETERS

Brass case, enameled, open face dial.



Diam., in.	4	5	6
Without thermometer ...	$6.00	9.00	12.50
With thermometer	7.00	10.00	13.50

SALINOMETERS AND POTS



Glass Salinometer Only

Length 11 in., temperature 190°, 200°, and 210° F. Sea water scale 0° to $\frac{5}{32}$°, ¼° graduation.

No. 1546 First grade.....per doz., $18.00
No. 7242 Second grade...per doz., 10.00

Salinometer Pot

No. 7458 Planished copper, 14 in. with wood handle .....each, $3.00

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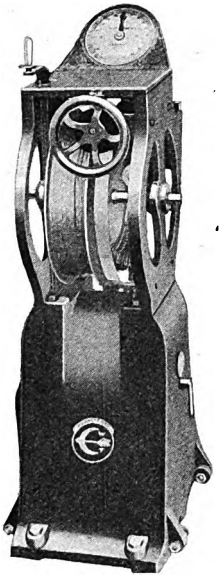
SOUNDING MACHINES

WHYTE, THOMSON'S PATENT ELECTRICAL SOUNDER

"Eza," Model Z

This machine is designed for use on ships where an electric supply is available, and the standard machines are fitted with motors for 100 volt circuit, but they can be supplied for any other voltage.

The motor is fitted in the base standard of the machine, which forms a watertight case. Inspection doors are provided at each side, fitted with watertight joints.



The motor is geared to the winding drum through toothed speed reducing wheels, and a friction clutch. This clutch is operated by the controller handle, and allows the motor to drive the drum for winding in or when the clutch is released allows the drum to run free for the purpose of taking a cast.

A magnetic brake is provided, also operated from the controller handle, which checks quickly the running out of the wire, but without applying a jerk or shock, which might give false records on the depth gauge.

The winding in is performed by the motor, and the speed is regulated and controlled also from the controller handle. The whole of the operations, viz., running out free, breaking and winding in, are controlled from one and the same handle, and the arrangement of the controller allows these to be performed in the following order: Free (taking cast), brake. Ready (brake on and clutch in), first speed, second speed and full speed (for winding in).

A large dial is fitted, showing the length of wire out, and this is directly in the line of the operator's eye, enabling him to see at a glance when to reduce the speed as the lead comes nearer the ship.

In case of breakdown electrically, or the electric supply not for the time being available, the machine can be used by hand. A hand brake is shown in the illustration, represented by the wheel. This serves the double purpose of a check brake for paying out, and the hand brake for applying when the machine is used by hand.

From this brief description it will be evident that the machine can be operated by hand or power, and with the latter the whole control is on one handle. This is shown in illustration on the top of the machine. The soundings can be by either depth gauge or chemical tubes.

This machine will be made with motors varying in power to suit the speeds at which they will be employed. It is more economical to follow this arrangement, for a ship that will sound at 17 or 18 knots requires a more powerful drive than one sounding at 10 or 12, and so on.

We are prepared to give a trial, free of cost, at speeds varying from 12 to 16 knots.

Prices and complete specifications upon application.

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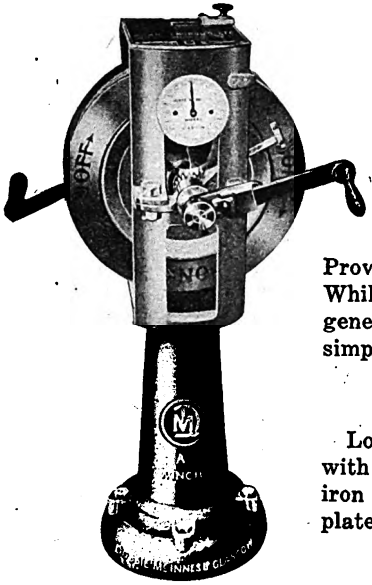
SOUNDING MACHINES



Dobbie McInnes Type A

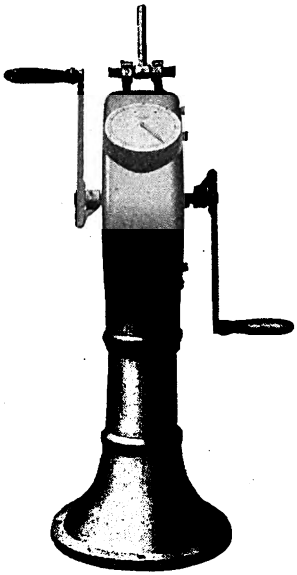
Dobbie McInnes Type A

This type of sounder is of very substantial construction. The recorder for ascertaining amount of wire run out is placed on the side of the frame and is easily read. The handles are detachable. Provided with improved brake. While having all improvements for general requirements it is of very simple construction.

White, Thomson & Co.

Lord Kelvin Patent, Model L, with hand brake, drop handles and iron pillar. Provided with deck plates and bolts.

White, Thomson & Co. Model L



Husun Type (Front View)

Husun Type with Pillar Stand

This is also an improved pattern with totally enclosed winch gear, recording apparatus and hand brake. Mounted upon an iron column, with drop handles and provided with deck plates and bolts. Complete with wire.

Husun Type (Side View)

Any of these winches furnished with either Kelvin recorder, Dobbie depthometer, chemically prepared glass tubes or new atmospheric depth gauge.

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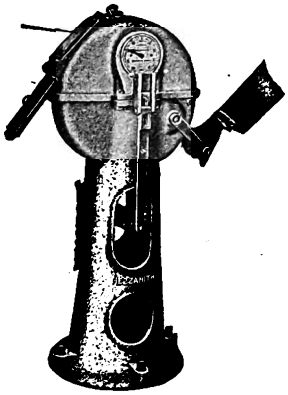
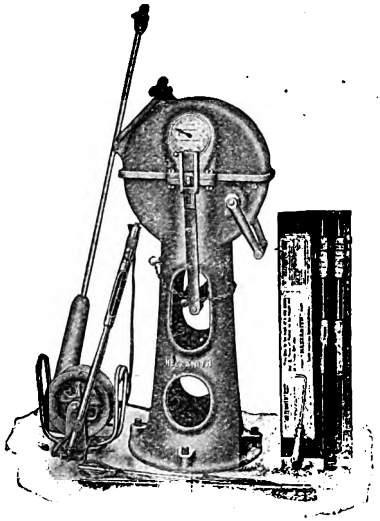
SOUNDING MACHINES

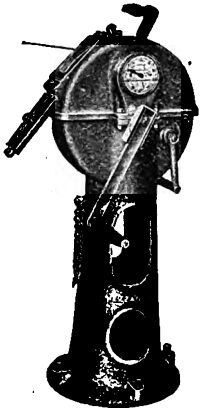
"HEZZANITH"



Wire Running out, Hand on Brake



Outfit Complete



Handles in Position to Wind in

This is Heath's improved latest model Sounding Machine. It has solid iron, hooded type drum with two band brakes, line measurer registering on dial length of wire run out, handles always on spindles, deck bolts, plates, etc. The drum is wound with 300 fathoms best strand steel galvanized wire with a breaking strain of about 760 pounds. The drum will hold about 400 fathoms of wire.

The depth recorder is best quality improved Thompson pattern. Three tins of tubes are included, each containing 10 best quality calibrated glass tubes with solid ends, together with spare case for used tubes, all in varnished wood box.

Two latest pattern sinkers.

Fair leader with machined wheel.

Fathom scale of boxwood, marked in fathoms and meters to a "Kew" certified standard.

Two sheaths for tubes, one with and one without lashing outfit complete.....$.....

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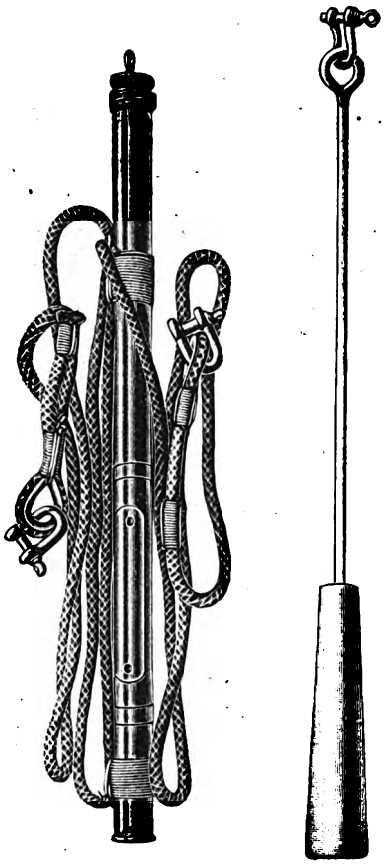
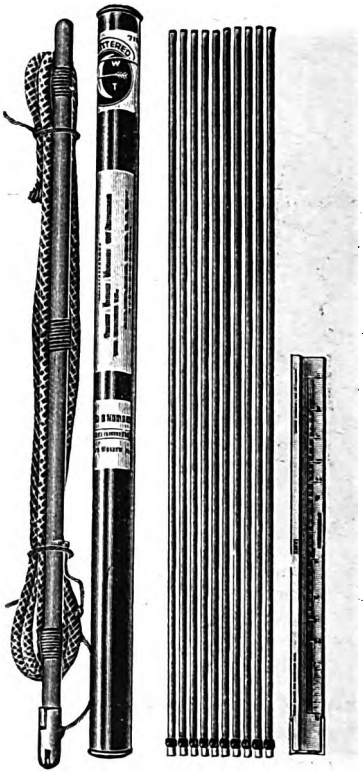
DEPTH RECORDERS

LORD KELVIN TYPE



The recording mechanism consists of a spring which is fixed to a piston which slides into the air tight chamber, as the gauge sinks, the pressure of the water forces the piston into the chamber and at the same time slips through a marker. When bottom has been reached and the gauge rises to the surface, the spring pulls the piston back with the marker locked to it. The reading of the marker as shown on the scale will be the depth absolute without any corrections.

CHEMICAL TUBE



This instrument consists of a brass tube, about 26 inches in length, which is secured to the rope attached to the sinker and connected to the wire. A glass tube, two feet long, coated inside with a preparation of chromate of silver, closed at one end and open at the other, is placed (with its end down) in the brass tube, as the sinker descends the increased pressure drives the sea water up the glass tube, which changes the chromate of silver into chloride of silver and leaves a white mark which indicates the height to which the water has been forced up the tube. A scale graduated to fathoms shows at once the depth that has been reached.

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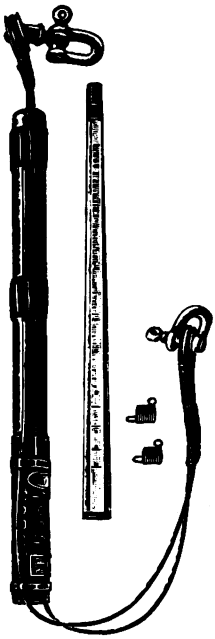
DEPTH RECORDERS

THE "SCEPTRE" RECORDER



An acurate depth recorder of simple construction, made of durable materials.

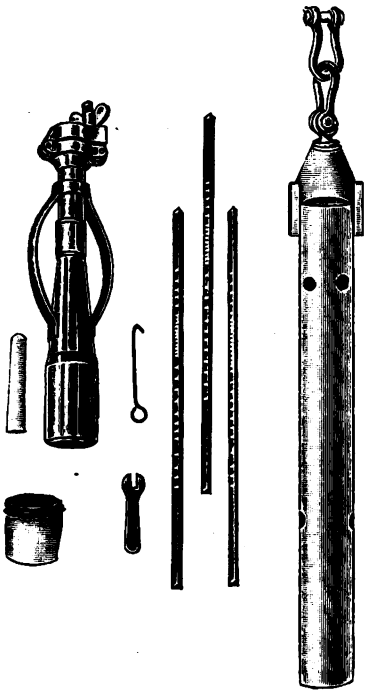
A clear white scale is fixed inside the tube, magnified by the water and easily read; cannot be lost or mislaid. Each tube is separately tested and graduated.

Very compact, no flat surfaces, offers little resistance to the water, tows truly, and is therefore easily hauled on board.

There are no glass tubes, no rubber valves or other packings to wear out or break.

No adjustments are necessary as the inflowing water itself forms the index.

DOBBIE "DEPTHOMETER"



The "Depthometer" is constructed of special bronze tubing with best gun metal fittings, all nickel plated, and consists of a tapered cylinder of very accurate bore, specially calibrated, in which the water is trapped and retained against the compression of air.

In use, the "Depthometer" is inclosed in the sinker carrying case, as illustrated which is attached to the sounding line.

There are no parts liable to derangement, no glass tubes, and its accurary is not affected by age.

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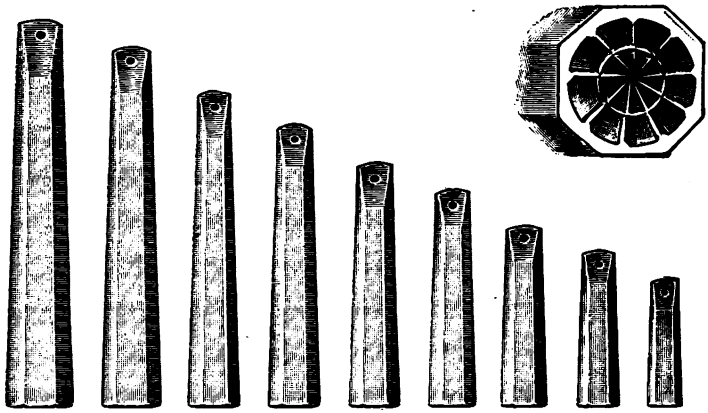
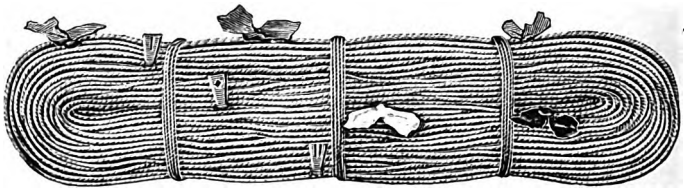
SOUNDING LEADS



Weight	50	30	28	25	20	16	10	8	6	4 lbs.

Sounding leads furnished in all weights, 2 lbs. and upwards .....per lb., $.....

LEAD LINES



Lead lines are made up in two ways, marked in nautical style as follows:

Deep sea, 3, 5, 7, 10, 13, 17, 25, 30, 35 fathoms and up by 5s.
Hand 2, 3, 5, 7, 10, 13, 17, 20, 25, 30, 35 fathoms and up by 5s.

We Carry in Stock:

American Hemp $\frac{5}{16}$, ⅜ and ½ inch, in 20, 40, 60 fathom lengths.
Italian Hemp, $\frac{5}{16}$, ⅜ and ½ inch, in 20, 40, 60 fathom lengths.
Cotton braided $\frac{5}{16}$, ⅜ and ½ inch, in 100 and 120 fathom lengths.

The Markings on a Lead Line

2 fathoms—2 strips of leather.
3 fathoms—3 strips of leather.
5 fathoms—White rag.
7 fathoms—Red rag.
10 fathoms—Leather with hole.
13 fathoms—Three strips of leather.
15 fathoms—White rag.
17 fathoms—Red rag.
20 fathoms—Two knots.
25 fathoms—One knot.
30 fathoms—Three knots.
35 fathoms—One knot.
40 fathoms—Four knots.

The intermediate soundings are called "Deeps," and the only fractions of a fathom used are quarters and halves.

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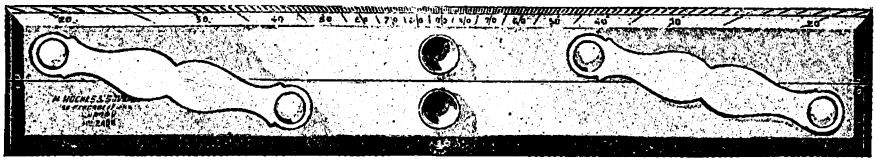
PARALLEL RULES

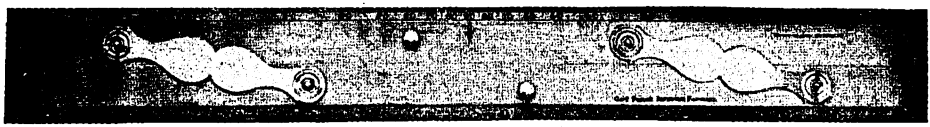
Hughes rolling rule, aluminum, electrum or brass in case

Length, in.	12	15	18	21	24
Each	$....	....	....	....	....



Field's bar pattern, aluminum, electrum or brass

Length, in.	12	15	18	21	24
Each	$....	....	....	....	....

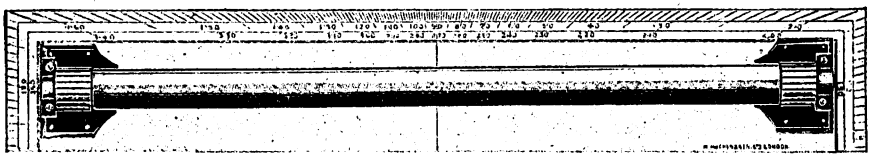


Field's bar pattern, ebony or boxwood

Length, in.	12	15	18	21	24
Each	$....	....	....	....	....

Plain ebony with brass fittings

Length, in.	12	15	18	21	24
Each	$....	....	....	....	....



Hughes XY rolling rule, made of clear xylonite with aluminum bridge bar, complete in whitewood case.

Length, in.	12	15	18	21	24
Each	$....	....	....	....	....

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DRAWING INSTRUMENTS, STATIONERY AND BOOKS

DRAWING INSTRUMENTS

We are in position to supply drawing instrument sets from the cheapest to the highest grades on short notice. Owing to the vastness of this line we do not show a detailed list but will be glad to quote prices on any style or make upon receipt of particulars.

STATIONERY

Our stock of stationery such as log slates felt bound, both single and double, slate pencils, lead pencils, crayons, pens, etc., is very complete at all times and we are in position to make deliveries on short notice.

NAVIGATION BOOKS

Wrinkles in Practical Navigation..... Lecky
Azimuth Tables ..... Burdwood
U. S. Hydrographic Azimuth Tables.....
Navigation ..... Hosmer
Elements of Navigation ..... Henderson
Modern Seamanship ..... Knight
New Guide to the U. S. Local Inspectors Examinations of Masters and Mates....Pugsley
Navigation Illustrated ..... Mayor
Simple Rules and Problems in Navigation..... Cugle
Navigation and Compass Deviation..... Muir
The Deck and Boat Book of the U. S. Navy.....
Nautical Almanac .....
American Ephemeris and Nautical Almanac.....
American Practical Navigator ..... Bowditch
Useful Tables ..... Bowditch
International Code Books .....
Book of the Sextant..... Hughes
Practical Marine Engineering ..... Dyson

CHARTS

Local District Agents for United States Hydrographic Office .....
Local Agents for U. S. Coast and Geodetic Survey Office .....
General Chart of Great Lakes.....
General Chart of each of the Great Lakes.....
Coast Charts of Great Lakes.....
Harbor Charts of all Harbors on Great Lakes.....

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NATIONAL STOCKLESS ANCHORS

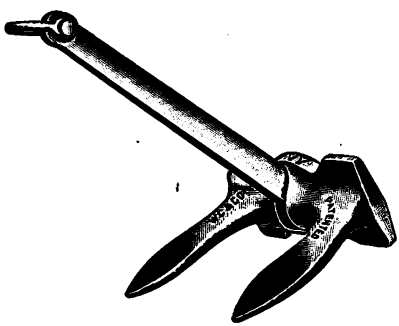
WE CARRY A LARGE AND VARIED STOCK OF ANCHORS AT ALL TIMES AND ARE PREPARED TO FILL YOUR REQUIREMENTS PROMPTLY.

American Bureau of Shipping, Lloyd's or Bureau Veritas tests furnished

TESTED—300 Lbs. TO 10.500 Lbs.
UNTESTED—300 " " 24,000 "

STOCKLESS ANCHORS

Untested Only **Galvanized**



Size	Each	Size	Each
5 pounds,	$1.20	80 pounds,	$11.00
10 "	2.00	100 "	13.50
15 "	2.75	125 "	16.75
20 "	3.50	150 "	20.25
25 "	4.25	175 "	23.50
30 "	5.10	200 "	27.00
35 "	5.65	225 "	30.25
40 "	6.20	250 "	33.75
50 "	7.30	300 "	40.50
60 "	8.50		

The following sizes are also carried in stock both Blacked and Galvanized—350, 400, 450, 500, 550, 600 pounds. Price per pound on application.

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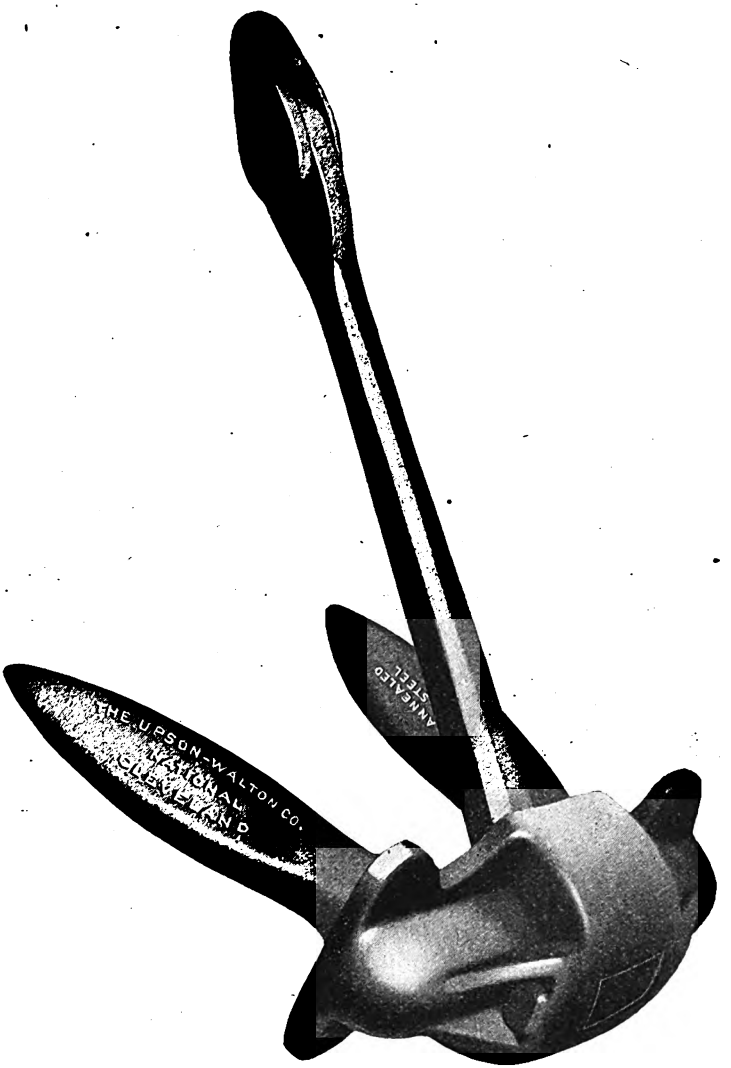
NATIONAL STOCKLESS ANCHOR



Furnished Tested or Untested

Prices and prints on application.

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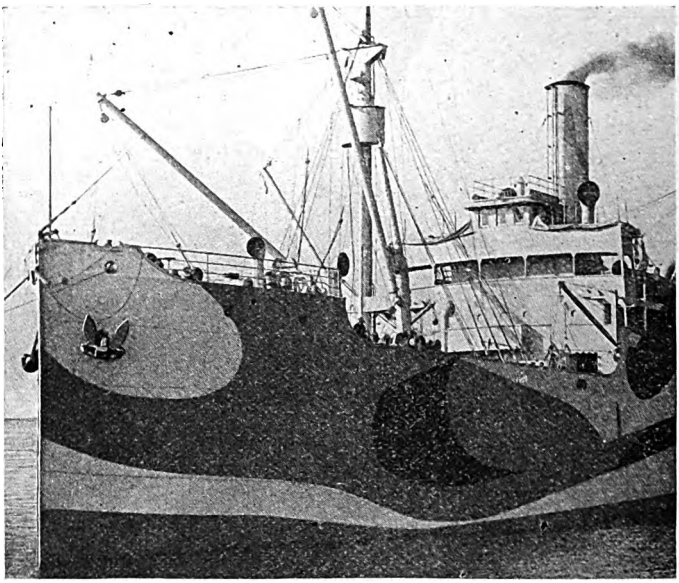
NATIONAL STOCKLESS ANCHORS

"UNCLE SAM" USES THEM



"See How It Stows?"

The sun never sets on the National Anchor

Eight Hundred Steamers Equipped During 1918 with National Stockless Anchors

Adopted by U. S. Shipping Board, Emergency Fleet Corporation

American Bureau of Shipping, Lloyd's or Bureau Veritas tests furnished

Tested up to 20,000 lbs.

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NATIONAL STOCKLESS ANCHORS

NATIONAL ANCHORS are so designed that they stow properly. No anchor stows as close or as easily, and its appearance in the hawse pipe is exceptionally fine. It was due to a request by the U. S. Navy for a modified anchor, incorporating essential features, that the National Anchor was designed. The head is in one piece. This head is of such design that it cannot foul, but rights itself instantly, which is of the greatest importance.

It may be interesting to note that at the time the first "National" was made in 1900, prices for imported anchors and the one or two made in this country, were more than twice the price that The Upson-Walton Co. of Cleveland sold National Anchors for in 1912.

On account of improvements made in 1912, it is safe and reasonable to state that the National has become the foremost anchor in design, efficiency and popularity in this or any other country. It is practical, exceptionally neat and attractive in appearance on the ship.

Today the loss of two anchors or more would not lay up a ship for ten days or even for ten hours, because with every known facility, including a testing plant of the latest design, approved by all inspecting companies here and in England and France, anchors can be secured on short notice.

In the twenty years we have been handling anchors, no one has come to us for an anchor and been unable to secure what they wanted when they wanted it. We have on hand, at all times, a stock of approximately 500 tons of anchors, which should prove conclusively that we are prepared to take care of every need in this line.

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LLOYD'S SPECIFICATIONS FOR ANCHORS, CABLES, ETC.

Equipment Numbers for IRON AND STEEL Vessels See Note (a) Above	not exceeding	Letters for Equipment as inserted in Register Book Column 7	GROSS TONNAGE LESS CREW SPACE See Note † Tons Above	not exceeding	ANCHORS: NUMBER Bower	Stream	Kedge	BOWER ANCHORS(b)(d) Stockless Weight Lbs.	Test * Lbs.	Collective Weight Lbs.	STREAM AND KEDGE ANCHORS (b) (c) (d) Stream Lbs.	Test* Lbs.	Kedge Lbs.	Test* Lbs.	CHAIN CABLES, HAWSERS, etc. STUD-CHAIN CABLES (e) (f) (h) Length Fthms.	Minimum Size Inches	Proved to Statutory Test Lbs.	Breaking Test Lbs.	Minimum Wght Lbs.
2400 and	3000	a	80 and	115	2	1	1	504	15344	980	84	——	56	——	120	11/16	19040	28560	3262
3000 "	3600	b	115 "	150	2	1	1	588	16912	1176	140	8176	56	——	120	12/16	22680	33880	3871
3600 "	4200	c	150 "	185	2	1	1	700	19040	1400	196	9408	84	——	135	13/16	26600	39872	5127
4200 "	4800	d	185 "	230	2	1	1	812	21168	1596	252	10640	84	——	165	14/16	30800	46200	7207
4800 "	5400	e	230 "	275	2	1	1	924	23184	1820	308	11760	112	——	165	15/16	35392	53088	8842
5400 "	6000	f	275 "	325	2	1	1	1008	24864	2016	336	12320	140	8176	165	1	40320	60480	9425
6000 "	6700	g	325 "	380	3	1	1	1148	27328	3276	392	13216	168	8736	165	1 1/16	45472	68096	10677
6700 "	7400	h	380 "	435	3	1	1	1400	32032	3976	448	14224	196	9408	195	1 2/16	50960	76440	14140
7400 "	8100	i	435 "	500	3	1	1	1624	35952	4676	476	14784	224	10080	195	1 3/16	56840	85120	15808
8100 "	8900	j	500 "	580	3	1	1	1876	40320	5376	532	15904	252	10640	210	1 4/16	63000	94360	18816
8900 "	9700	k	580 "	680	3	1	1	2128	44464	6076	588	16912	280	11200	210	1 5/16	69440	104160	20788
9700 "	10600	l	680 "	790	3	1	1	2380	48832	6776	644	17920	308	11760	210	1 6/16	76160	114240	22754
10600 "	11600	m	790 "	910	3	1	1	2604	52192	7476	672	18480	336	12320	210	1 7/16	83160	124600	24909
11600 "	12700	n	910 "	1040	3	1	1	2856	56336	8176	728	19600	392	13216	210	1 8/16	90720	131488	27109
12700 "	13900	o	1040 "	1200	3	1	1	3136	60704	8960	784	20720	448	14224	240	1 9/16	98336	137536	33451
13900 "	15200	p	1200 "	1380	3	1	1	3416	64960	9744	868	22176	476	14784	240	1 10/16	106400	148960	35773
15200 "	16700	q	1380 "	1580	3	1	1	3696	69104	10528	952	23744	504	15344	240	1 11/16	114800	160720	38606
16700 "	18500	r	1580 "	1820	3	1	1	3976	73360	11312	1036	25312	532	15904	240	1 12/16	123480	172760	41490
18500 "	20600	s	——		3	1	1	4340	78288	12320	1120	26880	560	16464	240	1 13/16	132440	185360	44554
20600 "	22700	t	——		3	1	1	4704	83104	13384	1232	28784	588	16912	240	1 14/16	141680	198240	47628
22700 "	25000	u	——		3	1	1	5040	87920	14336	1344	31024	616	17472	270	1 15/16	151200	211680	57274
25000 "	27300	v	——		3	1	1	5460	93072	15568	1456	33040	644	17920	270	2	161280	225792	60340
27300 "	29700	w	——		3	1	1	5880	98336	16744	1568	34944	672	18480	270	2 1/16	171360	239904	64246
29700 "	32200	x	——		3	1	1	6300	103376	17920	1680	36960	728	19600	270	2 2/16	182000	254800	68166

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LLOYD'S SPECIFICATIONS FOR ANCHORS, CABLES, ETC., CONTINUED

Equipment Numbers for IRON AND STEEL Vessels See Note (a)		Letters for Equipment as inserted in Register Book Column 7	GROSS TONNAGE LESS CREW SPACE See Note Tons		ANCHORS										CHAIN CABLES, HAWSERS, etc.				
					NUMBER			BOWER ANCHORS(b)(d) Stockless			STREAM AND KEDGE ANCHORS (b) (c) (d)				STUD-CHAIN CABLES (e) (f) (h)				
Above	not exceeding		Above	not exceeding	Bower	Stream	Kedge	Weight Lbs.	Test * Lbs.	Collective Weight Lbs.	Stream Lbs.	Test * Lbs.	Kedge Lbs.	Test * Lbs.	Length Fthms.	Minimum Size Inches	Proved to Statutory Test Lbs.	Breaking Test Lbs.	Minimum Wght Lbs.
32200 and	34800	y	—		3	1	1	6720	108304	19096	1820	39312	784	20720	270	2 3/16	192920	269920	72324
34800 "	37600	z	—		3	1	1	7140	112784	20384	1960	41664	840	21616	270	2 4/16	204120	285600	76423
37600 "	40400	a†	—		3	1	1	7616	117824	21784	2128	44464	896	22624	270	2 5/16	215600	301840	80728
40400 "	43200	b†	—		3	1	1	8120	123200	23184	2296	47376	1008	24864	300	2 6/16	227360	318304	94556
43200 "	46000	c†	—		3	1	1	8624	128240	24584	2464	50064	1120	26880	300	2 7/16	239456	335160	99712
46000 "	48800	d†	—		3	1	1	9100	132384	25984	2632	52640	1232	28784	300	2 8/16	252000	352800	105280
48800 "	51600	e†	—		3	1	1	9576	137200	27384	2800	55440	1344	31024	300	2 9/16	261408	365960	110768
51600 "	54600	f†	—		3	1	1	10080	141680	28840	2968	58240	1456	33040	300	2 10/16	270816	379120	116480
54600 "	57600	g†	—		3	1	1	10640	146384	30352	3136	60704	1568	34944	330	2 11/16	280224	392280	134400
57600 "	60600	h†	—		3	1	1	11200	150640	31920	3304	63280	1680	36960	330	2 12/16	289632	405440	140896
60600 "	63800	i†	—		3	1	1	11704	154468	33376	3472	65744	1792	38864	330	2 13/16	298816	418320	147504
63800 "	67000	j†	—		3	1	1	12208	157024	34832	3640	68320	1904	40880	330	2 14/16	308224	431480	154336
67000 "	70200	k†	—		3	1	1	12712	161952	36288	3808	70784	2016	42560	330	2 15/16	317408	444360	161280
70200 "	73400	l†	—		3	1	1	13216	165760	37632	3976	73360	2128	44464	330	3	326592	457184	168336
73400 "	76800	m†	—		3	1	1	13720	169120	39088	4172	75936	2240	46480	330	3 1/16	335552	469728	175616
76800 "	80200	n†	—		3	1	1	14224	172256	40544	4368	78624	2352	48384	330	3 2/16	344400	482160	183008
80200 "	83800	o†	—		3	1	1	14784	175840	42112	4564	81312	2464	50064	330	3 3/16	353248	494480	190512
83800 "	87600	p†	—		3	1	1	15344	179312	43680	4760	84000	2576	51744	330	3 4/16	361984	506688	198128
87600 "	91600	q†	—		3	1	1	15904	182784	45248	4956	86800	2688	53424	330	3 5/16	370496	518560	205968
91600 "	95800	r†	—		3	1	1	16520	186592	47040	5152	89264	2800	55440	330	3 6/16	378840	530320	213920
95800 "	100200	s†	—		3	1	1	17136	190400	48832	5348	91728	2912	57344	330	3 7/16	386960	541632	222096
100200 "	105000	t†	—		3	1	1	17808	193760	50624	5544	94192	3024	59024	330	3 8/16	395136	553056	230384

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LLOYD'S SPECIFICATIONS FOR CHAIN CABLES, HAWSERS, ETC.

Equipment Numbers for IRON AND STEEL Vessels See Note (a)		Letters for Equipment as inserted in Register Book Column 7	GROSS TONNAGE LESS CREW SPACE See Note † Tons		CHAIN CABLES, HAWSERS, etc.												
					STREAM, CHAIN OR STEEL WIRE (e) (g)						TOWLINE; HEMP OR STEEL WIRE (i)				HAWSERS AND WARPS		
					Length	CHAIN Minimum Weight			STEEL WIRE (i)		Lngth	HEMP	STEEL WIRE				
						Size	Stud Link	Short Link	Size Cir.	Breaking Test		Size Cir.	Size Cir.	Breaking Test	Size of Each Cir.	Size of Each Cir.	Lngth of Each
Above	not exceeding		Above	not exceeding	Fthms.	Inches	Lbs.	Lbs.	Inches	Lbs.	Fthms.	Inches	Inches	Lbs.	Inches	Inches	Fthms.
2400 and	3000	a	80 and	115	45	8/16	728	812	—	—	75	5½	2	15680	3	—	90
3000 "	3600	b	115 "	150	45	9/16	896	980	2	15680	75	6	2¼	21280	4	—	90
3600 "	4200	c	150 "	185	45	9/16	896	980	2	15680	75	6	2¼	21280	4	—	90
4200 "	4800	d	185 "	230	45	10/16	1092	1176	2¼	21280	75	6½	2¼	21280	4	—	90
4800 "	5400	e	230 "	275	45	10/16	1092	1176	2¼	21280	75	7	2½	28000	5	—	90
5400 "	6000	f	275 "	325	45	11/16	1223	1335	2¾	34720	75	7½	2½	28000	5½	—	90
6000 "	6700	g	325 "	380	60	11/16	1631	1771	2¾	34720	75	7½	2½	28000	5½	—	90
6700 "	7400	h	380 "	435	60	12/16	1935	2103	2¾	34720	75	8	2¾	34720	6	—	90
7400 "	8100	i	435 "	500	60	13/16	2279	2475	3	40320	75	8½	2¾	34720	6	—	90
8100 "	8900	j	500 "	580	60	13/16	2279	2475	3	40320	75	8½	2¾	34720	6	4	90
8900 "	9700	k	580 "	680	60	14/16	2621	2845	3¼	49280	90	9	3	40320	6	5	90
9700 "	10600	l	680 "	790	60	14/16	2621	2845	3¼	49280	90	9	3	40320	6	5	90
10600 "	11600	m	790 "	910	60	15/16	3033	3257	3½	58240	90	9½	3¼	49280	6	5	90
11600 "	12700	n	910 "	1040	75	15/16	3791	4071	3½	58240	90	10	3¼	49280	6	5	90
12700 "	13900	o	1040 "	1200	75	1	4284	4620	3¾	64960	90	10	3¼	49280	6	5	90
13900 "	15200	p	1200 "	1380	75	1	4284	4620	3¾	64960	90	10	3¼	49280	2 of 6	2 of 5	90
15200 "	16700	q	1380 "	1580	75	1 1/16	4853	5189	4	73920	90	11	3½	58240	2 " 6	2 " 5	90
16700 "	18500	r	1580 "	1820	75	1 1/16	4853	5189	4	73920	90	11	3½	58240	2 " 6	2 " 5	90
18500 "	20600	s	—		75	1 2/16	5438	5830	4¼	78400	90	12	4	73920	2 " 7	2 " 6	90
20600 "	22700	t	—		75	1 2/16	5438	5830	4¼	78400	100	12	4	73920	2 " 7	2 " 6	90
22700 "	25000	u	—		90	1 2/16	6526	6974	4¼	78400	100	12	4	73920	2 " 7	2 " 6	90
25000 "	27300	v	—		90	1 3/16	7296	7800	4½	87360	120	12	4	73920	2 " 7	2 " 7	90
27300 "	29700	w	—		90	1 3/16	7296	7800	4½	87360	120	13	4½	87360	2 " 7	2 " 7	90
29700 "	32200	x	—		90	1 3/16	7296	7800	4½	87360	120	13	4½	87360	2 " 7	2 " 7	90

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LLOYD'S SPECIFICATIONS FOR CHAIN CABLES, HAWSERS, ETC., CONTINUED

Equipment Numbers for IRON AND STEEL Vessels See Note (a)		Letters for Equipment as inserted in Register Book Column 7	GROSS TONNAGE LESS CREW SPACE See Note † Tons		CHAIN CABLES, HAWSERS, etc.												
					STREAM, CHAIN OR STEEL WIRE (e) (g)						TOWLINE; HEMP OR STEEL WIRE (i)				HAWSERS AND WARPS		
					Length	CHAIN Minimum Weight			STEEL WIRE (i)		Length	HEMP	STEEL WIRE				
						Size	Stud Link	Short Link	Size Cir.	Breaking Test		Size Cir.	Size Cir.	Breaking Test	Size of Each Cir.	Size of Each Cir.	Length of Each
Above	not exceeding		Above	not exceeding	Fthms.	Inches	Lbs.	Lbs.	Inches	Lbs.	Fthms.	inches	Inches	Lbs.	Inches	Inches	Fthms.
32200 and	34800	y	—		90	1 4/16	8064	8624	4¾	105280	120	14	4¾	105280	2 of 8	2 of 7	90
34800 "	37600	z	—		90	1 4/16	8064	8624	4¾	105280	120	14	5	132160	2 " 8	2 " 7	90
37600 "	40400	a†	—		90	1 5/16	8909	9525	5	132160	120	15	5¼	145600	2 " 8	2 " 7	90
40400 "	43200	b†	—		120	1 5/16	11879	12691	5	132160	130	15	5½	159040	2 " 8	2 " 8	100
43200 "	46000	c†	—		120	1 5/16	11879	12691	5	132160	130	15	5¾	174720	2 " 8	2 " 8	100
46000 "	48800	d†	—		120	1 6/16	13002	13898	5¼	145600	130	16	6	190400	2 " 8	2 " 8	100
48800 "	51600	e†	—		120	1 6/16	13002	13898	5¼	145600	130	16	6	190400	2 " 8	2 " 8	100
51600 "	54600	f†	—		120	1 7/16	14196	15774	5½	159040	130	16	6	190400	2 " 8	2 " 8	100
54600 "	57600	g†	—		120	1 8/16	15484	16408	6	190400	130	17	7	253120	2 " 8	2 " 8	100
57600 "	60600	h†	—		120	1 8/16	15484	16408	6	190400	130	—	7	253120	2 " 8	2 " 8	120
60600 "	63800	i†	—		120	1 9/16	16716	17808	6	190400	130	—	7	253120	2 " 8	2 " 8	120
63800 "	67000	j†	—		120	1 10/16	17892	19208	6	190400	130	—	7	253120	2 " 8	2 " 8	120
67000 "	70200	k†	—		150	1 11/16	24136	25928	6½	224000	140	—	7½	286720	3 " 8	2 " 8	120
70200 "	73400	l†	—		150	1 12/16	25928	27944	6½	224000	140	—	7½	286720	3 " 8	2 " 8	120
73400 "	76800	m†	—		150	1 13/16	27832	30072	6½	224000	140	—	7½	286720	3 " 8	2 " 8	120
76800 "	80200	n†	—		150	1 13/16	27832	30072	6½	224000	140	—	7½	286720	3 " 8	3 " 8	120
80200 "	83800	o†	—		150	1 14/16	29764	32256	7	253120	140	—	7½	286720	3 " 8	3 " 8	120
83800 "	87600	p†	—		150	1 14/16	29764	32256	7	253120	140	—	7½	286720	3 " 8	3 " 8	120
87600 "	91600	q†	—		150	1 15/16	31808	34608	7	253120	150	—	8	333760	3 " 8	3 " 8	120
91600 "	95800	r†	—		150	1 15/16	31808	34608	7	253120	150	—	8	333760	3 " 8	3 " 8	120
95800 "	100200	s†	—		150	2	33516	36960	7½	286720	150	—	8	333760	3 " 8	3 " 8	120
100200 "	105000	t†	—		150	2	33516	36960	7½	286720	150	—	8	333760	3 " 8	3 " 8	120

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LLOYD'S SPECIFICATIONS FOR ANCHORS, CABLES, HAWSERS, ETC.

†The equipment for Tug Steamers of a larger size than the Trawlers provided for by the above table shall be the same as for ordinary seagoing vessels.

The Anchors and Chains to be tested at a Public Testing Machine in accordance with the statutory tests.

*The tests of Anchors in this table are approximate tests; or as near as can be expressed in tons and aliquot parts of tons.

(a) By Section 50 of the Rules for the Building and Classification of Steel Vessels, it is provided that the equipment is to be regulated by the number produced by the sum of the measurements in feet of the greatest moulded breadth of the vessel and the depth from the upper part of the keel to the top of the upper deck beams at side at the middle of the length multiplied by the length of the vessel. In awning or shelter deck and part awning deck vessels the measurement of depth defined above is to be taken to the deck next below the awning or shelter deck, provided the height between the decks does not exceed 8 feet. If the 'tween deck height exceeds 8 feet the measurement is to be taken to a point 8 feet below the awning or shelter deck. In turret deck vessels to the normal beam line at base of turret.

For a sailing vessel with a poop, bridge, top-gallant forecastle, or a raised quarter-deck, the equipment number is to be increased *one-fifteenth* beyond that which it would be if she were flush-decked.

For a steam vessel having erections on deck, the number obtained by the first clause of this paragraph is to be increased as follows:—

For a raised quarter-deck, add the product of the height and length in feet of the erection.

For an awning or shelter deck, part awning deck, poop, bridge or forecastle add three-fourths the product of the height and length in feet of each erection, eight feet being taken as the maximum height for awning, or shelter deck, or part awning deck erections.

For deck houses or other erections not extending to the side, but exceeding either in length or breadth half the rule breadth of the vessel, add one-half the product of the height and length in feet of such erections.

Where erections are fitted upon erections, the equipment number is to be correspondingly increased.

(b) In order to meet the requirements of different trades, the weight of Anchors as given in the table may be modified as under:—

Where two Bower Anchors are required, one of them may be 7½ per cent lighter than the weight set forth in the table, provided the collective weight of the two Anchors is equal to that given in the table.

Where three Bower Anchors are required, one of them may be 15 per cent, and another 7½ per cent lighter than the weight set forth in the table, provided the collective weight of the three Anchors is equal to that given in table. Where it may be desired by the Owners the Bower Anchors may be of equal weight, provided the collective weight be not less than required by the table.

For sailing vessels: in no case may the best Bower Anchor be lighter than prescribed in the table, nor the third Bower be lighter than is allowed by this footnote.

(c) Stockless Stream and Kedge Anchors.—In the case of Stockless Stream and Kedge Anchors, an addition to the weight specified in this table must be made of one-fourth to compensate for the deficiency in weight consequent on the absence of Stock.

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LLOYD'S SPECIFICATIONS FOR ANCHORS, CABLES, HAWSERS, ETC.

(d) All Anchors, including Stream and Kedge Anchors exceeding 168 lbs. in weight, including Stock, to be tested according to the requirements of the Act of Parliament and the Certificates of Test produced.

(e) The Chain Cables and Stream Chains to be tested in all cases according to the requirements of the Act of Parliament, and the Certificates of Test produced.

(f) There should be included in the weights, 2 End Shackles to each Cable; that is 4 for each outfit, which contains two Cables.

(g) There should be included in the weights, 2 End Shackles to each Stream Chain.

(h) Unstudded close-link Chains will be admitted as Cables, if proved *two-thirds* the Test required for Stud-link Chains for the *tensile* strain, and 100 per cent above the *tensile* strain for the *breaking* strain.

(i) When steel wire Towlines or Hawsers are adopted, see notes (i) below.

Where a departure from the requirements of this table is proposed by an Owner the same should be submitted in the first place for the consideration of the Committee.

N. B.—The italic letters preceding the Equipment Numbers correspond with letters printed in the seventh column in the List of Steam Vessels in the Register Book to indicate the Equipment Numbers of vessels per this table.

(i) STEEL WIRE TOWLINES, HAWSERS AND WARPS

(i) When steel wire towlines, hawsers, or warps are adopted, a short length of each of the wires composing the towlines, etc., will be required, after being galvanized, to withstand the tensile stress equivalent to that set forth in Table 31, and the aggregate strength of the wires must not be less than 10 per cent in excess of that stress.

The use of flexible steel wire rope made of six strands of 18 wires laid round a hemp core will be approved when desired by the Owners, provided the rope is of the same size and strength as the ordinary steel wire hawser required by Tables 30 and 31.

Each wire will be required to be capable of being twisted around itself not less than eight times, and of being untwisted and straightened without breaking.

Each manufacturer to be required to provide on his premises machines suitable for satisfactorily making the foregoing tests, and the works to be at all times open to the inspection of the Society's Surveyors, who are to be empowered to retest any hawser or towline for which a certificate has been issued by the manufacturer.

Printed forms of Certificates, approved by the Committee, to be given by the Manufacturers of Steel Wire Hawsers, will be supplied to them upon application to the Secretary.

SPECIAL FLEXIBLE STEEL WIRE ROPE

When an Owner prefers to substitute special flexible steel wire ropes for steel wire rope of ordinary make, the sizes may be reduced in accordance with the foregoing table, provided each flexible rope be formed of six strands with 24 wires in each strand, and that the diameter of each wire is 1/56th of the circumference of the rope, and the ropes are capable of withstanding the breaking tests shown in the table.

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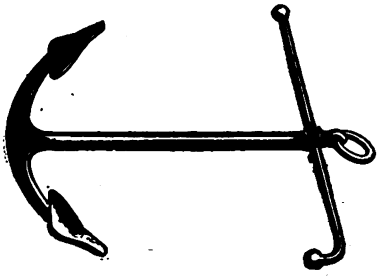
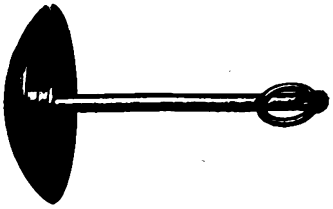
ANCHORS

KEDGE ANCHORS
Wrought Iron



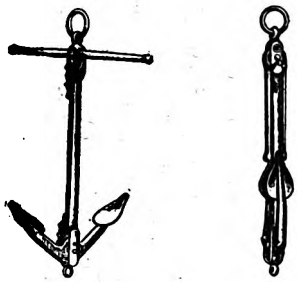
Weight Pounds	Galvanized Each	Black Each
4	$0.70	.58
5	.83	.67
6	.95	.75
7	1.07	.83
8	1.20	.93
9	1.30	1.00
10	1.42	1.08
12	1.53	1.17
14	1.63	1.25
15	1.70	1.30
16	1.76	1.33
18	1.88	1.42
20	2.00	1.50
Larger per lb	.11	.09

MUSHROOM ANCHORS
The Best Mooring for Muddy Bottoms



Weight	Black Per Lb.	Galvanized Per Lb.
4 to 25 lbs.	$0.12	.15
30 to 45 lbs.	.10	.13
50 to 75 lbs.	.10	.13
100 and larger	.09	.12

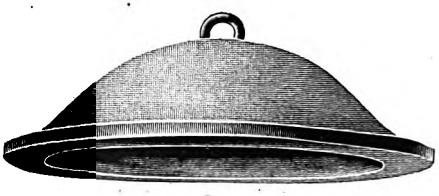
DIRIGO FOLDING ANCHOR
Galvanized Wrought Iron



Weight Pounds	Length Inches	Galvanized Each
4	17	$1.25
6	19	1.50
8	22	2.00
10	23	2.50
12	25	3.00
16	28	3.50
20	30	4.50
26 to 76 lbs.	per lb.,	.20

The only practical anchor on which both stock and flukes fold up, is kept open or closed by the same pin.

MOORING ANCHORS
Suction Type



This anchor is especially adapted for mud and sand bottoms.

Weight	Black Per Lb.	Galvanized Per Lb.
10 to 50 lbs.	$....	$....

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COIL CHAIN

PROOF COIL CHAIN

Size in Inches	Approximate Number of Links Per Foot	Outside Length of Link Inches	Outside Width of Link Inches	Weight per 100 Feet Pounds	Actual Proof Test Pounds	Approximate Breaking Strain Pounds
1/8	13	51/64	11/32	18½	450	900
3/16	13	1⅜	⅞	46	1,000	2,000
¼	12	1½	1 1/16	75	1,500	3,300
5/16	11	1⅞	1¼	110	2,600	5,200
⅜	9½	2⅛	1½	155	3,600	7,200
7/16	9	2¼	1 11/16	200	4,500	10,000
½	8	2½	1⅞	260	6,500	13,000
9/16	7½	2⅞	2⅛	325	8,000	16,000
⅝	6½	3⅜	2¼	400	9,500	20,000
¾	6	3⅞	2 11/16	590	13,500	28,800
⅞	5	4⅜	3⅛	800	18,500	39,000
1	4	5	3⅝	1,000	24,000	51,500
1⅛	3¾	5½	4	1,300	29,000	60,000
1¼	3⅜	6⅛	4⅜	1,500	39,000	80,000

B B COIL CHAIN

1/8	15	13/16	11/32	20½	475	950
3/16	14	1¼	¾	50	1,100	2,200
¼	13	1 7/16	13/16	80	1,650	3,300
5/16	12	1¾	1⅛	115	3,000	5,600
⅜	10½	1 15/16	1 1/16	160	4,000	8,000
7/16	9½	2 3/16	1 9/16	210	5,500	11,500
½	8½	2 7/16	1¾	265	7,000	15,000
9/16	8	2 13/16	2	335	8,800	18,500
⅝	7	3⅛	2⅛	410	10,750	23,000
¾	6¼	3⅝	2 9/16	600	15,500	33,500
⅞	5¼	4⅛	3	820	21,000	44,000
1	4¼	4¾	3½	1,030	28,500	59,000
1⅛	4	5¼	3⅞	1,350	36,000	74,000
1¼	3½	5⅞	4¼	1,550	43,000	86,000

B B B COIL CHAIN

1/8	17	29/32	11/32	21¾	500	1,000
3/16	16	1⅛	¾	52	1,200	2,400
¼	14	1⅜	13/16	83	1,750	4,500
5/16	13	1⅝	1⅛	118	3,400	7,000
⅜	11½	1⅞	1 7/16	166	4,500	9,000
7/16	10	2⅛	1 9/16	215	6,300	12,500
½	9	2⅜	1¾	268	8,000	16,500
9/16	8¼	2¾	2	340	10,000	22,000
⅝	7¼	3	2⅛	420	12,500	25,000
¾	6½	3½	2 9/16	610	17,750	35,000
⅞	5½	4 1/16	3	830	24,000	47,500
1	4½	4⅝	3½	1,040	31,350	64,500
1⅛	4⅛	5⅛	3⅞	1,400	38,000	78,000
1¼	3⅝	5¾	4¼	1,600	47,000	95,000

For sizes larger than shown in this table, see Dredge Chain.

CLOSE LINK OR STREAM CHAIN

For use as mooring and anchor chain on small and medium sized ships, made from the highest grade double refined iron obtainable. Made in all sizes from 3/16 to 1½ inch to Lloyds, American Bureau of shipping or private specifications. Orders should specify the length required and style of shackles wanted.

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DREDGE CHAIN

TABLE OF SIZES, DIMENSIONS, ETC.

				H. B. Quality				U-W Quality			
Size Inches	Length of Link Outside	Width of Link Outside	Standard Pitch	Proof-Test—Pounds	Approximate Breaking Strain—Pounds	Safe Working Load—Pounds	Approx. Wt. Per 100 Ft. Pounds	Proof-Test—Pounds	Approximate Breaking Strain—Pounds	Safe Working Load—Pounds	Approx. Wt. Per 100 Ft. Pounds
⅝	3	2⅛	1 11/16	12,000	25,000	7,200	400	14,000	27,000	8,000	400
¾	3½	2½	1 15/16	18,000	36,000	10,800	625	20,000	40,000	12,200	625
⅞	4	2⅞	2 3/16	24,500	48,000	14,700	800	26,000	52,000	16,100	800
1	4⅝	3¼	2½	32,000	61,000	19,200	1,000	33,750	67,500	20,500	1,000
1⅛	5⅛	3¾	2¾	40,000	78,000	24,000	1,300	41,500	83,000	25,500	1,300
1¼	5¾	4⅛	3⅛	49,000	95,000	29,400	1,600	52,000	104,000	31,200	1,600
1⅜	6 7/16	4 9/16	3 9/16	58,000	114,000	34,800	1,900	60,000	120,000	36,100	1,900
1½	7	5	3⅞	67,000	134,000	40,200	2,300	70,400	140,800	43,400	2,300
1⅝	7¾	5½	4¼	77,000	154,000	46,200	2,800	81,500	163,000	50,200	2,800
1¾	8½	5⅞	4¾	83,000	166,000	49,800	3,100	87,500	175,000	52,500	3,100
1⅞	9¼	6⅜	5¼	95,000	190,000	57,000	3,500	100,000	200,000	60,000	3,500
2	10	6¾	5¾	108,000	216,000	64,800	4,000	114,000	228,000	69,600	4,000
2⅛	10¾	7⅛	6¼	122,000	244,000	73,200	4,700	129,000	258,000	77,400	4,700
2¼	11½	7⅝	6¾	136,500	273,000	81,900	5,300	143,000	286,000	85,800	5,300
2⅜	11⅞	8	6⅞	152,000	304,000	91,200	5,850	159,500	319,000	95,700	5,850
2½	12¼	8⅜	7	168,500	337,000	102,100	6,500	180,000	360,000	108,000	6,500

SPECIAL U-W QUALITY

Size, Inches	Length of Link Outside	Width of Link Outside	Standard Pitch	Proof-Test—Pounds	Approximate Breaking Strain—Pounds	Safe Working Load—Pounds	Approx. Wt. Per 100 Ft.—Pounds
⅝	3	2⅛	1 11/16	14,000	27,000	8,000	400
¾	3½	2½	1 15/16	20,000	40,000	12,200	625
⅞	4	2⅞	2 3/16	26,000	52,000	16,100	800
1	4⅝	3¼	2½	33,750	67,500	20,500	1,000
1⅛	5⅛	3¾	2¾	41,500	83,000	25,500	1,300
1¼	5¾	4⅛	3⅛	52,000	104,000	31,200	1,600
1⅜	6 7/16	4 9/16	3 9/16	60,000	120,000	36,100	1,900
1½	7	5	3⅞	70,400	140,800	43,400	2,300
1⅝	7¾	5½	4¼	81,500	163,000	50,200	2,800
1¾	8½	5⅞	4¾	87,500	175,000	52,500	3,100
1⅞	9¼	6⅜	5¼	100,000	200,000	60,000	3,500
2	10	6¾	5¾	114,000	228,000	69,600	4,000
2⅛	10¾	7⅛	6¼	129,000	258,000	77,400	4,700
2¼	11½	7⅝	6¾	143,000	286,000	85,800	5,300
2⅜	11⅞	8	6⅞	159,500	319,000	95,700	5,850
2½	12¼	8⅜	7	180,000	360,000	108,000	6,500

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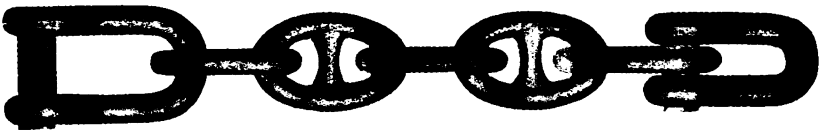
STUD LINK, SHIPS' ANCHOR OR CABLE CHAIN



All our stud chain is made from the highest grade double-refined iron, rolled in our own rolling mills. Our many years of experience in producing chain iron insures an even quality throughout, tough and fibrous and possessing hard-wearing qualities.

LLOYD'S SPECIFICATIONS

On the following pages we list sizes and specifications to Lloyd's approved (English) standards. We are prepared to furnish Stud Link Chain in all sizes to these specifications, and will furnish Lloyd's test and inspection certificates with any chains so ordered. Lloyd's surveyors are in constant attendance at our factories and conduct all tests.

The specifications listed in the catalog are the latest approved by Lloyd's. We are promptly advised of any changes put into effect, so that customers can with confidence send in orders specifying Stud Link Chains to Lloyd's test and inspection, and we will know just what to furnish.

AMERICAN BUREAU OF SHIPPING SPECIFICATIONS

We also list specifications for Stud Link Chain made to the latest approved standards of the American Bureau of Shipping. Chain for use on vessels of American Registry should be furnished to these standards. It will be noted that with few exceptions these specifications are practically the same as Lloyd's. All chains are furnished with test and inspection certificate by the American Bureau of Shipping.

BUREAU VERITAS

We are at all times prepared to furnish Stud Link Chain tested to Bureau Veritas requirements, and will be pleased to execute orders for such material.

AMERICAN CHAIN COMPANY'S PRIVATE TEST AND INSPECTION

Stud Link Chain subject to our own test and inspection is made to the same specifications as that of the American Bureau of Shipping. The same grade of material is used and the tests are identically the same, the only difference being that we conduct the test and issue our own private test certificate. No charge is made for these certificates.

We strongly suggest to our customers the use of Stud Link Chain to our own test wherever possible, as it not only will be found to be just as high grade throughout as chain made to Lloyd's, American Bureau of Tests or Bureau Veritas, but will be found to be much cheaper, as we are not obliged to pay outside test and inspection agencies' fees.

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STUD LINK, SHIPS' ANCHOR OR CABLE CHAIN

DIMENSIONS, WEIGHTS AND TESTS OF STUD LINK CHAIN CABLES

As Approved by Lloyd's Register of Shipping, April, 1915

Common Links				Enlarged Links			End Links					
Size of Cable in Inches	Approved Length Outside in Inches	Approved Width Outside in Inches	Length of Six Links Over All in Inches	Size of Material in Inches	Approved Length Outside in Inches	Approved Width Outside in inches	Size of Material in Inches	Approved Length Outside in Inches	Approved Width Outside in Inches	Approximate Weight per Fathom in Pounds	Actual Proof-Stress in Pounds	Approximate Break. Strain in Pounds
5/8	3 3/4	2 1/4	16 1/4	11/16	4 1/16	2 1/2	3/4	4 1/16	2 1/2	24	15,680	23,520
11/16	4 1/8	2 15/32	17 7/8	3/4	4 15/32	2 3/4	27/32	4 15/32	2 3/4	27	19,040	28,560
3/4	4 1/2	2 11/16	19 1/2	27/32	4 7/8	3	29/32	4 7/8	3	32	22,680	33,880
13/16	4 7/8	2 15/16	21 1/8	7/8	5 9/32	3 1/4	31/32	5 9/32	3 1/4	38	26,600	39,872
7/8	5 1/4	3 5/32	22 3/4	31/32	5 11/16	3 1/2	1 1/16	5 11/16	3 1/2	43	30,800	46,200
15/16	5 5/8	3 3/8	24 3/8	1 1/32	6 3/32	3 3/4	1 1/8	6 3/32	3 3/4	50	35,392	53,088
1	6	3 13/32	26	1 3/32	6 1/2	4	1 3/16	6 1/2	4	57	40,320	60,480
1 1/16	6 3/8	3 27/32	27 5/8	1 5/32	6 29/32	4 1/4	1 9/32	6 29/32	4 1/4	65	45,472	68,096
1 1/8	6 3/4	4 1/16	29 1/4	1 1/4	7 5/16	4 1/2	1 11/32	7 5/16	4 1/2	73	50,960	76,440
1 3/16	7 1/8	4 9/32	30 7/8	1 5/16	7 23/32	4 3/4	1 7/16	7 23/32	4 3/4	81	56,840	85,120
1 1/4	7 1/2	4 1/2	32 1/2	1 3/8	8 1/8	5	1 1/2	8 1/8	5	90	63,000	94,360
1 5/16	7 7/8	4 23/32	34 1/8	1 7/16	8 17/32	5 1/4	1 19/32	8 17/32	5 1/4	99	69,440	104,160
1 3/8	8 1/4	4 15/16	35 3/4	1 1/2	8 15/16	5 1/2	1 21/32	8 15/16	5 1/2	108	76,160	114,240
1 7/16	8 5/8	5 3/16	37 3/8	1 19/32	9 11/32	5 3/4	1 23/32	9 11/32	5 3/4	119	83,160	124,600
1 1/2	9	5 13/32	39	1 21/32	9 3/4	6	1 13/16	9 3/4	6	129	90,720	131,488
1 9/16	9 3/8	5 5/8	40 5/8	1 23/32	10 5/32	6 1/4	1 7/8	10 5/32	6 1/4	139	98,336	137,536
1 5/8	9 3/4	5 27/32	42 1/4	1 25/32	10 9/16	6 1/2	1 15/16	10 9/16	6 1/2	149	106,400	148,960
1 11/16	10 1/8	6 3/32	43 7/8	1 7/8	10 31/32	6 3/4	2 1/32	10 31/32	6 3/4	161	114,800	160,720
1 3/4	10 1/2	6 5/16	45 1/2	1 15/16	11 3/8	7	2 3/32	11 3/8	7	172	123,480	172,760
1 13/16	10 7/8	6 17/32	47 1/8	2	11 25/32	7 1/4	2 3/16	11 25/32	7 1/4	186	132,440	185,360
1 7/8	11 1/4	6 3/4	48 3/4	2 1/16	12 3/16	7 1/2	2 1/4	12 3/16	7 1/2	199	141,680	198,240
1 15/16	11 5/8	6 31/32	50 3/8	2 1/8	12 19/32	7 3/4	2 11/32	12 9/32	7 3/4	212	151,200	211,680
2	12	7 3/16	52	2 3/16	13	8	2 13/32	13	8	223	161,280	225,792

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STUD LINK, SHIPS' ANCHOR OR CABLE CHAIN

DIMENSIONS, WEIGHTS AND TESTS OF STUD LINK CHAIN CABLES—Continued

Common Links				Enlarged Links			End Links					
Size of Cable in Inches	Approved Length Outside in Inches	Approved Width Outside in Inches	Length of Six Links Over All in Inches	Size of Material in Inches	Approved Length Outside in Inches	Approved Width Outside in Inches	Size of Material in Inches	Approved Length Outside in Inches	Approved Width Outside in Inches	Approximate Weight per Fathom in Pounds	Actual Proof-Stress in Pounds	Approximate Break. Strain in Pounds
2 1/16	12 3/8	7 7/16	53 5/8	2 9/32	13 3/32	8 1/4	2 15/32	13 13/32	8 1/4	238	171,360	239,904
2 1/8	12 3/4	7 21/32	55 1/4	2 11/32	13 13/16	8 1/2	2 9/16	13 13/16	8 1/2	252	182,000	254,800
2 3/16	13 1/8	7 7/8	56 7/8	2 13/32	14 7/32	8 3/4	2 5/8	14 7/32	8 3/4	268	192,920	269,920
2 1/4	13 1/2	8 3/32	58 1/2	2 15/32	14 5/8	9	2 11/16	14 5/8	9	283	204,120	285,600
2 5/16	13 7/8	8 11/32	60 1/8	2 17/32	15 1/32	9 1/4	2 25/32	15 1/32	9 1/4	299	215,600	301,840
2 3/8	14 1/4	8 9/16	61 3/4	2 5/8	15 7/16	9 1/2	2 27/32	15 7/16	9 1/2	315	227,360	318,304
2 7/16	14 5/8	8 25/32	63 3/8	2 11/16	15 27/32	9 3/4	2 15/16	15 27/32	9 3/4	332	239,456	335,160
2 1/2	15	9	65	2 3/4	16 1/4	10	3	16 1/4	10	353	252,000	352,800
2 9/16	15 3/8	9 7/32	66 5/8	2 13/16	16 21/32	10 1/4	3 1/16	16 21/32	10 1/4	369	261,408	365,960
2 5/8	15 3/4	9 7/16	68 1/4	2 7/8	17 1/16	10 1/2	3 5/32	17 1/16	10 1/2	388	270,816	379,120
2 11/16	16 1/8	9 11/16	69 7/8	2 31/32	17 15/32	10 3/4	3 7/32	17 15/32	10 3/4	407	280,224	392,280
2 3/4	16 1/2	9 29/32	71 1/2	3 1/32	17 7/8	11	3 5/16	17 7/8	11	427	289,632	405,440
2 13/16	16 7/8	10 1/8	73 1/8	3 3/32	18 9/32	11 1/4	3 3/8	18 9/32	11 1/4	447	298,816	418,320
2 7/8	17 1/4	10 11/32	74 3/4	3 5/32	18 11/16	11 1/2	3 7/16	18 11/16	11 1/2	468	308,224	431,480
2 15/16	17 5/8	10 29/32	76 3/8	3 7/32	19 3/32	11 3/4	3 17/32	19 3/32	11 3/4	489	317,408	444,360
3	18	10 13/16	78	3 5/16	19 1/2	12	3 19/32	19 1/2	12	510	326,592	457,184

Furnished in 15 and 30 fathom shots, with or without Joiner and Anchor Shackles, as ordered. If Shackles are required, orders should clearly specify the style as well as the exact number wanted with each shot or length of chain.

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STUD LINK, SHIPS' ANCHOR OR CABLE CHAIN

DIMENSIONS, WEIGHTS AND TESTS OF STUD LINK CHAIN CABLES

As Approved by American Bureau of Shipping, September, 1917

Also Specifications of Stud Link Made to American Chain Co.'s Private Test and Inspection

Common Links				Enlarged Links			Short End Links			Long End Links					
Size of Cable in Inches	Approved Length Outside in Inches	Approved Width Outside in Inches	Length of Six Links Over All in Inches	Size of Material in Inches	Approved Length Outside in Inches	Approved Width Outside in Inches	Size of Material in Inches	Approved Length Outside in Inches	Approved Width Outside in Inches	Size of Material in Inches	Approved Length Outside in Inches	Approved Width Outside in Inches	Approximate Weight per 15 Fathoms in Pounds	Actual Proof-Test in Pounds	Breaking Strain in Pounds
5/8	3 3/4	2 3/16	16 1/4	11/16	4	2 3/8	11/16	4	2 1/2	11/16	4 11/16	2 1/2	365	15,680	23,560
11/16	4 1/8	2 7/16	17 7/8	3/4	4 3/8	2 5/8	3/4	4 3/8	2 3/4	3/4	5 3/16	2 3/4	405	19,040	28,560
3/4	4 1/2	2 5/8	19 1/2	13/16	4 3/4	2 13/16	7/8	4 3/4	3	7/8	5 5/8	3	480	22,680	33,880
13/16	4 7/8	2 7/8	21 1/8	7/8	5 3/16	3 1/16	15/16	5 3/16	3 1/4	15/16	6 1/8	3 1/4	570	26,600	39,872
7/8	5 1/4	3 1/8	22 3/4	15/16	5 9/16	3 5/16	1	5 9/16	3 1/2	1	6 9/16	3 1/2	655	30,800	46,200
15/16	5 5/8	3 5/16	24 3/8	1	6	3 9/16	1 1/16	6	3 3/4	1 1/16	7 1/16	3 3/4	755	35,392	53,088
1	6	3 9/16	26	1 1/16	6 3/8	3 3/4	1 1/8	6 3/8	4	1 1/8	7 9/16	4	855	40,320	60,480
1 1/16	6 3/8	3 3/4	27 5/8	1 1/8	6 3/4	4	1 3/16	6 3/4	4 1/4	1 3/16	8	4 1/4	970	45,472	68,096
1 1/8	6 3/4	4	29 1/4	1 3/16	7 3/16	4 1/4	1 1/4	7 3/16	4 1/2	1 1/4	8 1/2	4 1/2	1,085	50,960	76,440
1 3/16	7 1/8	4 1/4	30 7/8	1 1/4	7 9/16	4 1/2	1 3/8	7 9/16	4 3/4	1 3/8	8 15/16	4 3/4	1,215	56,840	85,120
1 1/4	7 1/2	4 1/2	32 1/2	1 5/16	7 15/16	4 3/4	1 7/16	7 15/16	5	1 7/16	9 7/16	5	1,345	63,000	94,360
1 5/16	7 7/8	4 3/4	34 1/8	1 3/8	8 3/8	4 15/16	1 1/2	8 3/8	5 1/4	1 1/2	9 7/8	5 1/4	1,485	69,440	104,160
1 3/8	8 1/4	4 15/16	35 3/4	1 7/16	8 3/4	5 3/16	1 9/16	8 3/4	5 1/2	1 9/16	10 3/8	5 1/2	1,625	76,120	114,240
1 7/16	8 5/8	5 3/16	37 3/8	1 1/2	9 3/16	5 7/16	1 5/8	9 3/16	5 3/4	1 5/8	10 7/8	5 3/4	1,775	83,160	124,600
1 1/2	9	5 3/8	39	1 9/16	9 9/16	5 11/16	1 11/16	9 9/16	6	1 11/16	11 5/16	6	1,935	90,720	131,488
1 9/16	9 3/8	5 5/8	40 5/8	1 11/16	9 15/16	5 7/8	1 3/4	9 15/16	6 1/4	1 3/4	11 3/4	6 1/4	2,090	98,336	137,536
1 5/8	9 3/4	5 7/8	42 1/4	1 3/4	10 3/8	6 1/8	1 13/16	10 3/8	6 1/2	1 13/16	12 1/4	6 1/2	2,235	106,400	148,960
1 11/16	10 1/8	6 1/16	43 7/8	1 13/16	10 3/4	6 3/8	1 7/8	10 3/4	6 3/4	1 7/8	12 3/4	6 3/4	2,410	114,800	160,720
1 3/4	10 1/2	6 5/16	45 1/2	1 7/8	11 1/8	6 5/8	2	11 1/8	7	2	13 3/16	7	2,590	123,480	172,760
1 13/16	10 7/8	6 1/2	47 1/8	1 15/16	11 9/16	6 7/8	2 1/16	11 9/16	7 1/4	2 1/16	13 11/16	7 1/4	2,785	132,440	185,360
1 7/8	11 1/4	6 3/4	48 3/4	2	11 15/16	7 1/16	2 1/8	11 15/16	7 1/2	2 1/8	14 1/8	7 1/2	2,975	141,680	198,240
1 15/16	11 5/8	7	50 3/8	2 1/16	12 3/8	7 5/16	2 3/16	12 3/8	7 3/4	2 3/16	14 5/8	7 3/4	3,175	151,200	211,680
2	12	7 3/16	52	2 1/8	12 3/4	7 9/16	2 1/4	12 3/4	8	2 1/4	15 1/16	8	3,355	161,280	225,792
2 1/16	12 3/8	7 7/16	53 5/8	2 3/16	13 1/8	7 13/16	2 5/16	13 1/8	8 1/4	2 5/16	15 9/16	8 1/4	3,570	171,360	239,904
2 1/8	12 3/4	7 5/8	55 1/4	2 1/4	13 1/2	8	2 3/8	13 1/2	8 1/2	2 3/8	16	8 1/2	3,785	182,000	254,800
2 3/16	13 1/8	7 7/8	56 7/8	2 5/16	13 15/16	8 1/4	2 7/16	13 15/16	8 3/4	2 7/16	16 1/2	8 3/4	4,015	192,920	269,920

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STUD LINK SHIPS' ANCHOR OR CABLE CHAIN

DIMENSIONS, WEIGHTS AND TESTS OF STUD LINK CHAIN CABLES—Continued

	Common Links			Enlarged Links			Short End Links			Long End Links					
Size of Cable in Inches	Approved Length Outside in Inches	Approved Width Outside in Inches	Length of Six Links Over All in Inches	Size of Material in Inches	Approved Length Outside in Inches	Approved Width Outside in Inches	Size of Material in Inches	Approved Length Outside in Inches	Approved Width Outside in Inches	Size of Material in Inches	Approved Length Outside in Inches	Approved Width Outside in Inches	Approximate Weight per 15 Fathoms in Pounds	Actual Proof-Test in Pounds	Breaking Strain in Pounds
2¼	13½	8⅛	58½	2⅜	14⅜	8½	2 9/16	14⅜	9	2 9/16	16 15/16	9	4,245	204,120	285,600
2 3/16	13⅞	8 5/16	60⅛	2 7/16	14¾	8¾	2⅝	14¾	9¼	2⅝	17 7/16	9¼	4,485	215,600	301,840
2⅜	14¼	8 9/16	61¾	2½	15 3/16	9	2 11/16	15 3/16	9½	2 11/16	17⅞	9½	4,725	227,360	318,304
2 7/16	14⅝	8¾	63⅜	2 9/16	15 9/16	9 3/16	2¾	15 9/16	9¾	2¾	18⅜	9¾	4,960	239,456	335,160
2½	15	9	65	2⅝	15 15/16	9 7/16	2 13/16	15 15/16	10	2 13/16	18⅞	10	5,265	252,000	352,800
2 9/16	15⅜	9¼	66⅝	2¾	16 5/16	9 11/16	2⅞	16 5/16	10¼	2⅞	19 5/16	10¼	5,535	261,408	365,960
2⅝	15¾	9 7/16	68¼	2 13/16	16¾	9 15/16	2 15/16	16¾	10½	2 15/16	19¾	10½	5,815	270,816	379,120
2 11/16	16⅛	9 11/16	69⅞	2⅞	17⅛	10⅛	3	17⅛	10¾	3	20¼	10¾	6,105	280,224	392,280
2¾	16½	9⅞	71½	2 15/16	17 9/16	10⅜	3⅛	17 9/16	11	3⅛	20¾	11	6,405	289,632	405,440
2 13/16	16⅞	10⅛	73⅛	3	17 15/16	10⅝	3 3/16	17 15/16	11¼	3 3/16	21 3/16	11¼	6,705	298,816	418,320
2⅞	17¼	10⅜	74¾	3 1/16	18 5/16	10⅞	3¼	18 5/16	11½	3¼	21 11/16	11½	7,015	308,224	431,480
2 15/16	17⅝	10 9/16	76⅜	3⅛	18¾	11⅛	3 5/16	18¾	11¾	3 5/16	22⅛	11¾	7,330	317,408	444,360
3	18	10 13/16	78	3 3/16	19⅛	11⅜	3⅜	19⅛	12	3⅜	22⅝	12	7,650	326,592	457,184
3 1/16	18⅜	11	79⅝	3¼	19½	11⅝	3 7/16	19½	12¼	3 7/16	23 1/16	12¼	7,980	335,552	469,728
3⅛	18¾	11¼	81¼	3 5/16	19 15/16	11 13/16	3½	19 15/16	12½	3½	23 9/16	12½	8,320	344,400	482,160
3 3/16	19⅛	11½	82¾	3⅜	20 5/16	12 1/16	3 3/16	20 5/16	12¾	3 9/16	24	12¾	8,660	353,248	494,480
3¼	19½	11 11/16	84½	3 7/16	20¾	12¼	3⅝	20¾	13	3⅝	24½	13	9,010	361,984	506,688
3 5/16	19⅞	11 15/16	86⅛	3½	21⅛	12½	3¾	21⅛	13¼	3¾	24 15/16	13¼	9,360	370,496	518,560
3⅜	20¼	12⅛	87¾	3 9/16	21½	12¾	3 13/16	21½	13½	3 13/16	25 7/16	13½	9,725	378,840	530,320
3 7/16	20⅝	12⅜	89⅜	3⅝	21 15/16	13	3⅞	21 15/16	13¾	3⅞	25 15/16	13¾	10,095	386,960	541,632
3½	21	12⅝	91	3¾	22 5/16	13¼	3 15/16	22 5/16	14	3 15/16	26⅜	14	10,475	395,136	553,056
3¾	22½	13½	97½	4	23⅞	14 3/16	4¼	23⅞	15	4¼	28¼	15	12,025	425,370	588,320

Furnished in 15 or 30 fathom shots, with or without Joiner and Anchor Shackles, as ordered. If Shackles are required, orders should clearly specify the style as well as the exact number wanted with each shot or length of chain.

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STUD LINK CHAIN

OLD AMERICAN SHIP WINDLASS CO. MEASUREMENTS

Size Inches	Length of Six Links Inches	Outside Length in Inches	Outside Width in Inches	Space Between Ends of Links	Weight per Fathom Pounds	Proof Test	Breaking Strain
½	13	3	1¾	1	14	9,500	15,500
9/16	14⅝	3⅜	2	1⅛	18	11,750	18,500
⅝	16¼	3¾	2¼	1¼	24	12,500	22,000
11/16	17⅛	4	2½	1¼	29	17,000	28,000
¾	18¾	4⅜	2¾	1⅜	34	20,250	32,000
13/16	20⅜	4¾	3	1½	40	23,750	36,000
⅞	21¼	5	3¼	1½	44	28,000	42,000
15/16	22⅞	5⅜	3½	1⅝	51	31,600	48,000
1	25¼	5⅞	3¾	1⅞	59	36,000	54,000
1 1/16	26⅞	6¼	3⅞	2	66	40,600	62,000
1⅛	27¾	6½	4⅛	2	75	45,500	70,000
1 3/16	28⅝	6¾	4¼	2	82	50,750	76,000
1¼	30¼	7⅛	4½	2⅛	91	56,250	86,000
1 5/16	31⅛	7⅜	4⅝	2⅛	103	62,000	94,000
1⅜	32¾	7¾	4⅞	2¼	113	68,000	102,000
1 7/16	34⅜	8⅛	5⅛	2⅜	120	74,250	112,000
1½	36	8½	5⅜	2½	132	81,000	118,000
1 9/16	37⅝	8⅞	5⅝	2⅝	143	87,800	124,000
1⅝	39¼	9¼	5⅞	2¾	156	95,000	134,000
1 11/16	40⅞	9⅝	6	2⅞	162	102,500	144,000
1¾	42½	10	6¼	3	175	110,250	156,000
1 13/16	43⅜	10¼	6½	3	189	118,250	166,000
1⅞	44¼	10½	6¾	3	205	126,500	178,000
1 15/16	45⅛	10¾	7	3	222	135,000	190,000
2	46¾	11⅛	7¼	3⅛	240	144,000	202,000
2 1/16	48⅜	11½	7½	3¼	250	153,000	216,000
2⅛	50¾	12	7¾	3½	265	162,500	228,000
2 3/16	53⅛	12½	8	3¾	280	172,250	242,000
2¼	55½	13	8¼	4	300	182,250	256,000
2 5/16	56⅝	13¼	8½	4	313	192,625	271,000
2⅜	57¼	13½	8¾	4	325	203,000	286,000
2 7/16	58⅛	13¾	8⅞	4	343	214,000	301,000
2½	59	14	9	4	360	225,000	316,000

Irrespective of above tables always, in ordering, give outside measurements of links.

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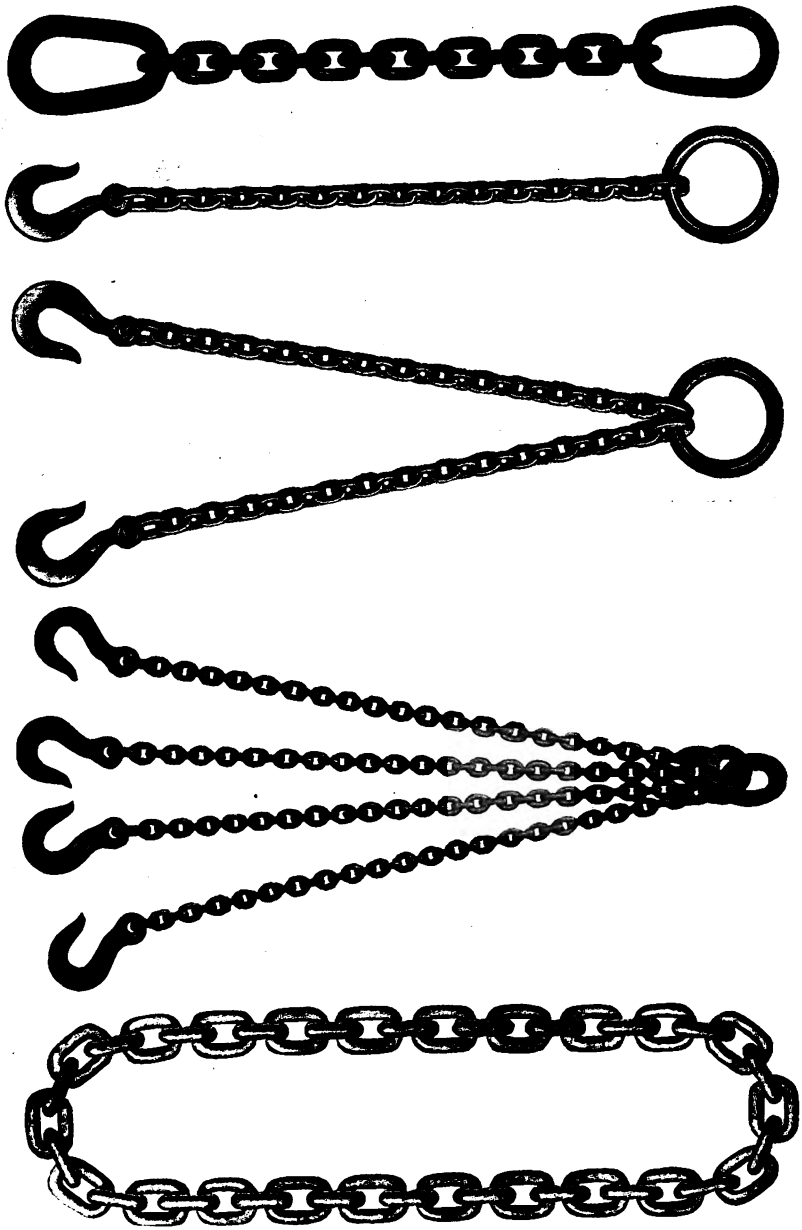
CHAIN SLINGS



We are prepared to furnish slings of any pattern made from our special U-W quality dredge chain. In ordering, give the size and length over all of chain. Hooks and rings are selected in proper proportion to the size chain ordered. Prices on receipt of specifications.

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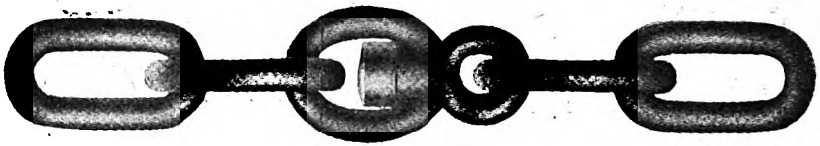
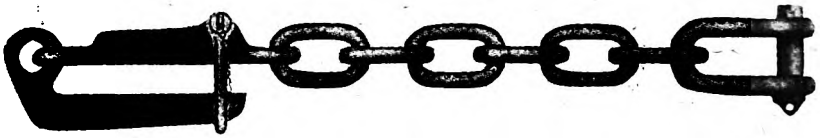
CHAIN FITTINGS

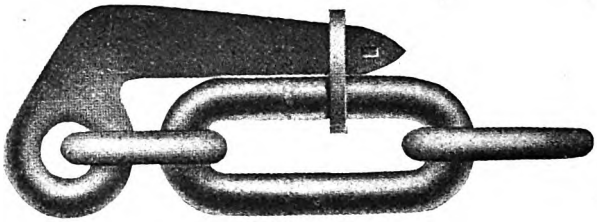
SWIVEL PIECE



BLAKE STOPPER



SENHOUSE SLIP



CHAIN STOPPER

Above fittings furnished to order for any size chain. Prices on request.

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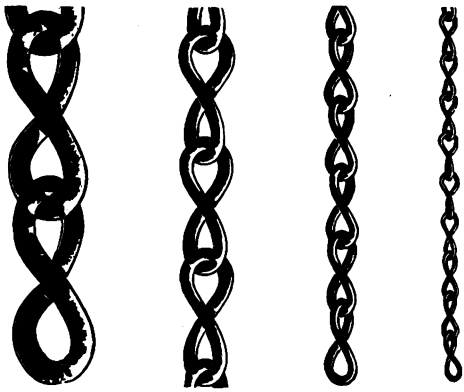
SMALL CHAINS

SINGLE JACK CHAINS

No. 10 No. 14 No. 18 No. 24

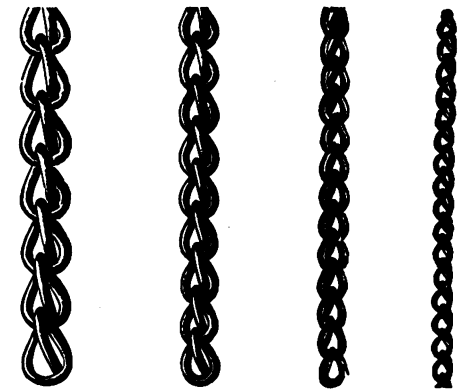


Per Box of 12 Yards

No.	Iron	Brass	No.	Iron	Brass
6	$1.30	$8.00	16	$0.48	$1.00
7	1.10	6.35	17	.48	.84
8	.95	5.25	18	.45	.70
9	.90	4.25	19	.40	.60
10	.80	3.50	20	.40	.55
11	.70	2.80	21	.40	.50
12	.65	2.30	22	.40	.50
13	.60	1.92	23	.40	.50
14	.55	1.60	24	.40	.50
15	.50	1.25			

DOUBLE JACK CHAINS

No. 15 No. 18 No. 20 No. 24



Per Box of 12 Yards

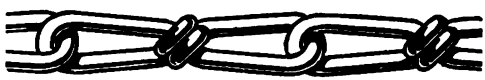
No.	Iron	Brass	No.	Iron	Brass
10	$0.95	$4.75	18	$0.48	$0.90
11	.85	3.77	19	.45	.76
12	.72	3.20	20	.45	.72
13	.65	2.50	21	.45	.70
14	.60	2.05	22	.45	.70
15	.58	1.60	23	.45	.70
16	.53	1.32	24	.45	.70
17	.51	1.10			

SAMSON COIL CHAIN

Galvanized

No.	2	1	0	2/0
Per 100 ft.	$1.80	2.00	2.30	2.50
No.	3/0	4/0	5/0	6/0
Per 100 ft.	$3.25	3.75	4.50	6.00

BULLDOG CHAIN



No.	7	6	5	4
Per 100 ft.	$1.15	1.15	1.25	1.35
No.	3	2	1	0
Per 100 ft.	$1.40	1.50	1.60	1.75
No.	2/0	3/0	4/0	5/0	6/0
Per 100 ft.	$2.00	2.50	3.00	3.25	3.75

GALVANIZED TILLER CHAINS

For Launches

Nos.	80	130	250
Weight	Light	Medium	Heavy
500 ft. reels per 100 ft.	$3.30	4.35	6.30
100 or 300 ft. per 100 ft.	3.60	4.65	6.60

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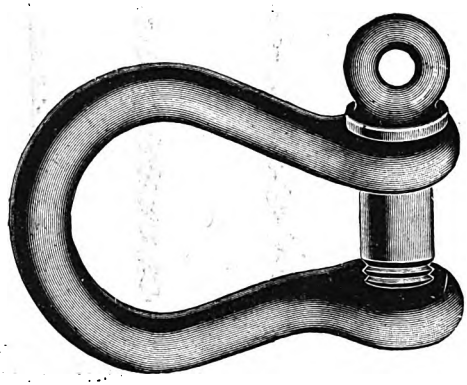
SHACKLES

SCREW ANCHOR SHACKLES

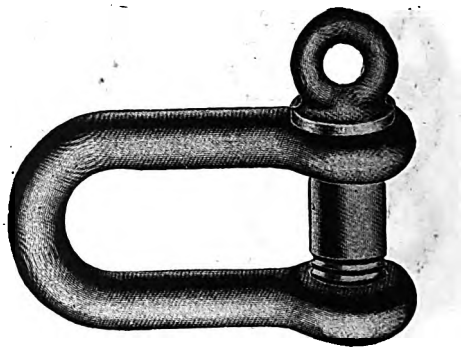
Wrought Iron



Size in Inches	Length Inside in Inches	Width Betw'n Eyes in Inches	Diam. of Pin in Inches	Est. Weight per Hundred in Pounds	Gal-vanized Each	Black'd Each
3/16	7/8	3/8	1/4	8	$0.25	$0.23
1/4	1	7/16	5/16	12	.25	.23
5/16	1 1/8	1/2	3/8	21	.25	.23
3/8	1 7/16	5/8	7/16	32	.27	.25
7/16	1 5/8	11/16	1/2	47	.31	.29
1/2	1 7/8	3/4	5/8	73	.37	.33
9/16	2 1/8	7/8	5/8	91	.41	.37
5/8	2 3/8	1	3/4	151	.48	.41
3/4	2 7/8	1 1/4	7/8	223	.56	.46
7/8	3 1/4	1 1/2	1	331	.85	.68
1	3 1/2	1 5/8	1 1/8	481	1.20	.96
1 1/8	4 1/4	1 7/8	1 1/4	610	1.60	1.25
1 1/4	4 1/2	2	1 3/8	852	2.27	1.78
1 3/8	5	2 3/8	1 1/2	1179	2.60	2.08
1 1/2	6	2 1/2	1 5/8	1519	3.25	2.60
1 5/8	6 1/2	2 3/4	1 3/4	1910	4.50	3.60
1 3/4	7	3	1 7/8	2450	6.00	4.80
2	7 3/4	3 1/2	2 1/8	3900	9.25	7.55

SCREW CHAIN SHACKLES

Wrought Iron



Size in Inches	Length Inside in Inches	Width Betw'n Eyes in Inches	Diam. of of Pin in Inches	Est. Weight per Hundred in Pounds	Gal-vanized Each	Black'd Each
3/16	3/4	5/16	1/4	7	$0.25	$0.23
1/4	13/16	7/16	5/16	11	.25	.23
5/16	1	1/2	3/8	18	.27	.23
3/8	1 3/16	9/16	7/16	25	.27	.25
7/16	1 3/8	5/8	1/2	41	.31	.29
1/2	1 9/16	3/4	5/8	68	.37	.33
9/16	1 3/4	7/8	5/8	81	.41	.37
5/8	1 7/8	1	3/4	142	.48	.41
3/4	2 1/4	1 1/4	7/8	189	.56	.46
7/8	2 1/2	1 3/8	1	305	.85	.68
1	3	1 1/2	1 1/8	451	1.20	.96
1 1/8	3 1/4	1 5/8	1 1/4	553	1.60	1.25
1 1/4	3 1/2	1 3/4	1 3/8	781	2.27	1.78
1 3/8	4 1/4	2	1 1/2	1110	2.60	2.08
1 1/2	4 3/4	2 1/4	1 5/8	1480	3.25	2.60
1 5/8	5 1/4	2 3/8	1 3/4	1650	4.50	3.60
1 3/4	5 3/4	2 1/2	1 7/8	1820	6.00	4.80
2	6 3/4	2 3/4	2 1/8	2880	9.25	7.55

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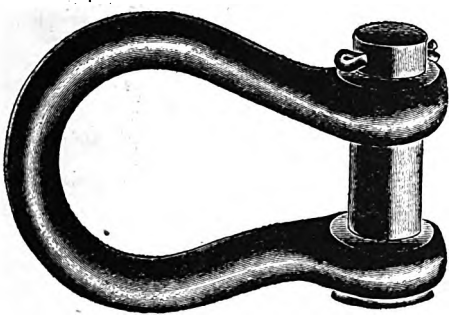
SHACKLES

ROUND PIN ANCHOR SHACKLES

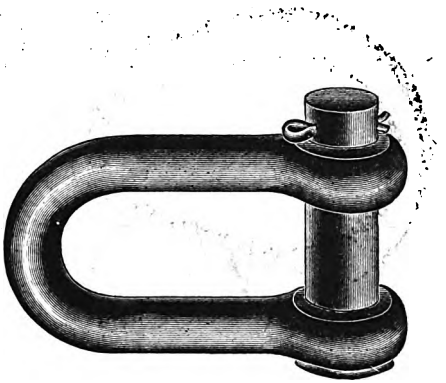
Wrought Iron



Size in Inches	Length Inside in Inches	Width Betw'n Eyes in Inches	Diam. of Pin in Inches	Est. Weight per Hundred in Pounds	Gal-vanized Each	Black'd Each
¼	1	7/16	5/16	12	$0.25	$0.23
5/16	1⅛	½	⅜	20	.25	.23
⅜	1 7/16	⅝	7/16	31	.27	.25
7/16	1⅝	11/16	½	50	.31	.29
½	1⅞	¾	⅝	72	.37	.33
9/16	2⅛	⅞	⅝	93	.41	.37
⅝	2⅜	1	¾	165	.48	.41
¾	2⅞	1¼	⅞	232	.55	.45
⅞	3¼	1½	1	341	.75	.60
1	3½	1⅝	1⅛	489	1.10	.85
1⅛	4¼	1⅞	1¼	634	1.45	1.10
1¼	4½	2	1⅜	855	2.10	1.60
1⅜	5	2⅜	1½	1219	2.40	1.90
1½	6	2½	1⅝	1550	3.10	2.50
1⅝	6½	2¾	1¾	1885	4.30	3.40
1¾	7	3	1⅞	2400	5.75	4.55
2	7¾	3½	2⅛	3900	9.00	7.30

ROUND PIN CHAIN SHACKLES

Wrought Iron



Size in Inches	Length Inside in Inches	Width Betw'n Eyes in Inches	Diam. of Pin in Inches	Est. Weight per Hundred in Pounds	Gal-vanized Each	Black'd Each
¼	13/16	7/16	5/16	12	$0.25	$0.23
5/16	1	½	⅜	19	.25	.23
⅜	1 3/16	9/16	7/16	25	.27	.25
7/16	1⅜	⅝	½	43	.31	.29
½	1 9/16	¾	⅝	69	.37	.33
9/16	1¾	⅞	⅝	82	.41	.37
⅝	1⅞	1	¾	142	.48	.41
¾	2¼	1¼	⅞	203	.55	.45
⅞	2½	1⅜	1	288	.75	.60
1	3	1½	1⅛	458	1.10	.85
1⅛	3¼	1⅝	1¼	539	1.45	1.10
1¼	3½	1¾	1⅜	763	2.10	1.60
1⅜	4¼	2	1½	1110	2.40	1.90
1½	4¾	2¼	1⅝	1480	3.10	2.50
1⅝	5¼	2⅜	1¾	1650	4.30	3.40
1¾	5¾	2½	1⅞	1820	5.75	4.55
2	6¾	2¾	2⅛	2800	9.00	7.30

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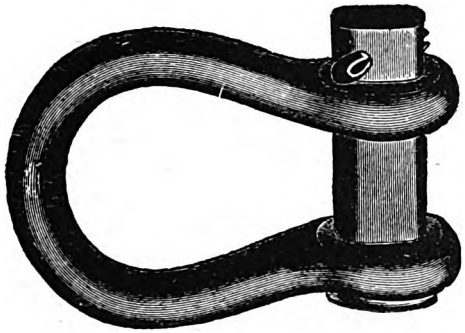
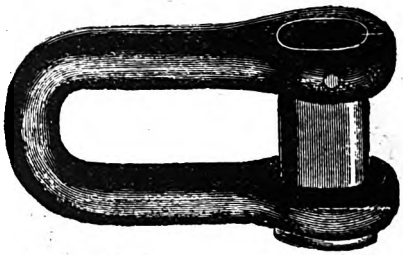
SHACKLES

OVAL PIN ANCHOR SHACKLES
Wrought Iron



Size in Inches	Length Inside in Inches	Width Betw'n Eyes in Inches	Size of Pin Thickness in Inches	Size of Pin Width in Inches	Est. Weight per Hundred in Pounds	Galvanized Each	Black'd Each
¼	1	7/16	5/16	⅜	13	$0.23	$0.21
5/16	1⅛	½	11/32	7/16	19	.23	.21
⅜	1 7/16	⅝	13/32	½	29	.25	.23
7/16	1⅝	11/16	7/16	9/16	44	.30	.28
½	1⅞	¾	½	11/16	85	.35	.31
9/16	2⅛	⅞	½	11/16	100	.40	.35
⅝	2⅜	1	11/16	⅞	178	.46	.40
¾	2⅞	1¼	¾	1	281	.54	.45
⅞	3¼	1½	13/16	1 3/16	380	.72	.61
1	3½	1⅝	1	1⅜	591	1.17	.92
1⅛	4⅛	1⅞	1 1/16	1½	690	1.70	1.35
1¼	4 3/16	2	1 3/16	1¾	961	2.08	1.70
1⅜	4 13/16	2 5/16	1⅜	2⅛	1353	2.70	2.25
1½	6	2½	1 5/16	2⅛	1570	3.35	2.70
1⅝	6½	2¾	1½	2⅛	1895	4.40	3.50
1¾	7	3	1½	2⅛	2400	5.60	4.50
2	7¾	3½	1¾	2⅜	3910	8.80	6.25
						Pound	Pound
2¼	8¾	3¾	1⅞	2½	4400	.22	.18
2⅜	...	...	...	...	....	.22	.18
2½	...	...	...	...	....	.22	.18
2⅝	...	...	...	...	....	.22	.18
2¾	...	...	...	...	....	.22	.18

OVAL PIN CHAIN SHACKLE
Wrought Iron



Size in Inches	Length Inside in Inches	Width Betw'n Eyes in Inches	Size of Pin Thickness in Inches	Size of Pin Width in Inches	Est. Weight per Hundred in Pounds	Galvanized Each	Black'd Each
¼	13/16	7/16	5/16	⅜	10	$0.23	$0.21
5/16	1	½	⅜	7/16	11	.23	.21
⅜	1 3/16	9/16	⅜	½	23	.25	.23
7/16	1⅜	⅝	7/16	13/32	39	.30	.28
½	1 9/16	¾	½	11/16	70	.35	.31
9/16	1¾	⅞	½	11/16	84	.40	.35
⅝	1⅞	1	11/16	⅞	136	.46	.40
¾	2¼	1¼	23/32	1	221	.54	.45
⅞	2½	1⅜	25/32	1 3/16	309	.65	.55
1	3	1½	15/16	1⅜	491	1.10	.85
1⅛	3½	1⅝	1⅛	1½	561	1.55	1.20
1¼	3⅞	2 1/16	1¼	1 25/32	766	1.90	1.50
1⅜	4⅞	2⅛	1 5/16	2 1/16	1110	2.25	1.75
1½	5¼	2¼	1 5/16	2 1/16	1480	3.00	2.50
1⅝	5⅝	2⅜	1½	2⅛	1650	3.45	2.75
1¾	6	2½	1½	2⅛	1820	4.40	3.50
2	7	2¾	1¾	2⅜	2880	6.55	5.40
						Pound	Pound
2¼	7½	3	1⅞	2½	4298	.22	.18
2⅜	...	...	...	....	....	.22	.18
2½	...	...	...	...	....	.22	.18
2⅝	...	...	...	...	....	.22	.18
2¾	...	...	...	...	....	.22	.18

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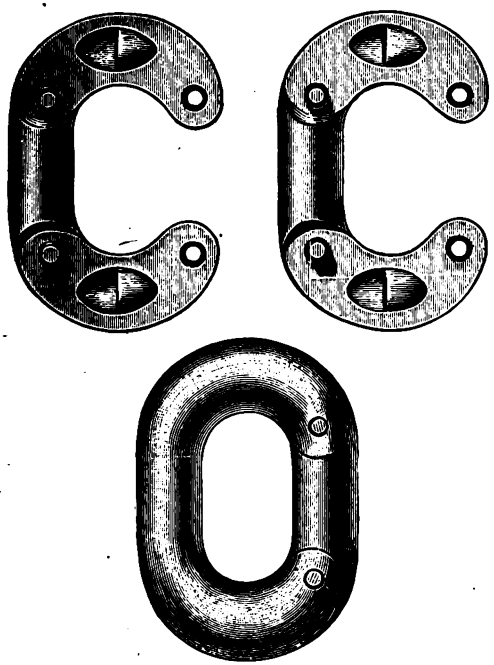
CHAIN REPAIRS, PUNCHES AND HOOKS

CONNECTING LINKS

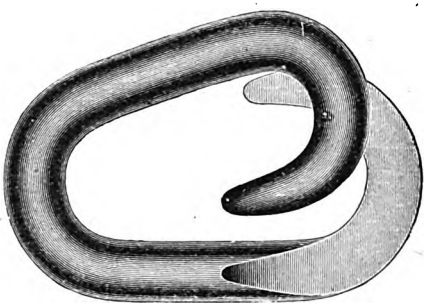
Drop Forged Steel with Interlocking Lugs



Size Inches	Outside Dimensions of Links Inches	Price per Dozen Plain.	Price per Dozen Galv.
¼	1½x1	$1.00	$1.35
5/16	1 11/16x1 3/16	1.10	1.45
⅜	2 1/16x1⅜	1.20	1.60
7/16	2⅜x1½	1.35	1.80
½	2⅝x1¾	1.50	2.10
9/16	3 x1 15/16	1.80	2.55
⅝	3 5/16x2 3/16	2.00	3.00
11/16	3½x2 5/16	2.65	3.75
¾	3⅞x2½	3.35	4.50
⅞	4 5/16x2 15/16	5.00	6.50
1	4⅞x3 5/16	7.00	9.00
1⅛	5⅝x3¾	16.00	19.00
1¼	6 x4⅛	21.50	25.00
1⅜	6¾x4¾	29.40	34.00
1½	7¼x5⅛	36.00	42.25
1⅝	8 x5½	45.00	52.00

LAP LINKS

Galvanized Wrought Iron



Size, in.	⅛	3/16	¼	5/16	⅜
Per doz.	$0.55	.60	.65	.75	1.00
Size, in.	7/16	½	9/16	⅝	
Per doz.	$1.25	1.80	2.15	2.50	

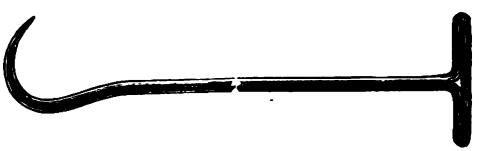
CHAIN PUNCHES

Cast Steel

Size, in.	3/16	¼	5/16	⅜	½	¾
Per dozen	$3.60	3.60	3.60	3.60	3.80	4.00

CHAIN HOOKS

Wrought Iron



Size wire, in.	⅜	½	⅝
Length, in.	23½	25	28
Galvanized each	$0.50	.75	1.00
Blacked, each	.45	.70	.90

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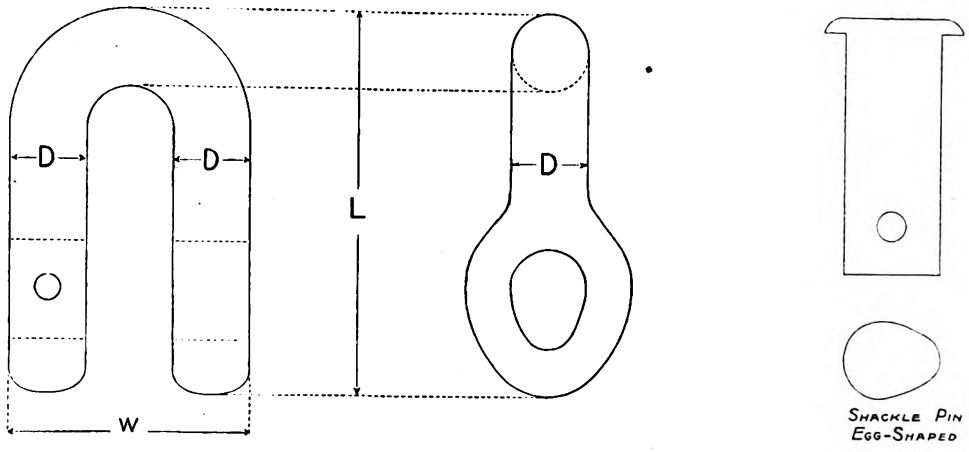
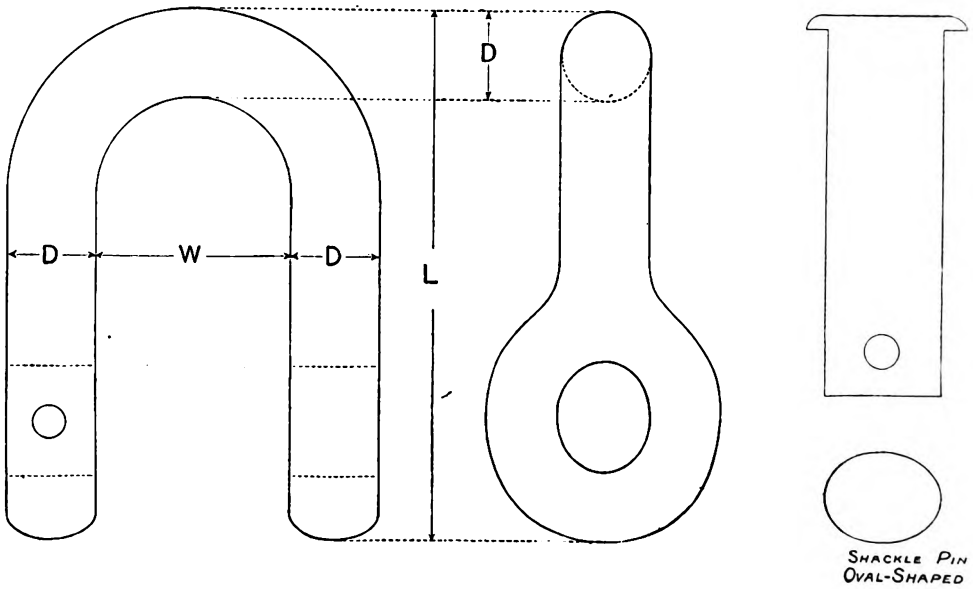
JOINING AND ANCHOR SHACKLES

To Lloyd's Register of Shipping Specifications

JOINING SHACKLE—A



END OR ANCHOR SHACKLE—B



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SHACKLES

DIMENSIONS AND WEIGHTS OF SHACKLES ACCOMPANYING STUD LINK CHAIN CABLES

Approved by Lloyd's Register of Shipping, April, 1915

	Joining Shackles A				End of Anchor Shackles B				
Size of Cable on which Used in Inches	D Diameter of Shackle in Inches	L Length of Shackle Outside in Inches	W Width of Shackle Outside in Inches	Approximate Weight Including Pin in Pounds	D Diameter of Shackle at Sides in Inches	D Diameter of Shackle at End in Inches	L Length of Shackle Outside in Inches	W Width of Shackle in the Clear in Inches	Approximate Weight Including Pin in Pounds
5/8	13/16	4 7/16	2 1/2	2 1/8	7/8	15/16	5 1/2	2	3 3/4
11/16	7/8	4 7/8	2 3/4	3	31/32	1 7/32	6 1/16	2 1/4	5
3/4	31/32	5 11/32	3	3 3/4	1 1/16	1 1/8	6 19/32	2 3/8	6 1/2
13/16	1 1/16	5 25/32	3 1/4	5 1/2	1 1/8	1 3/32	7 5/32	2 1/2	7 1/4
7/8	1 1/8	6 3/32	3 1/2	6	1 3/32	1 5/16	7 11/16	2 3/4	10
15/16	1 7/32	6 21/32	3 3/4	7 1/2	1 5/16	1 13/32	8 1/4	3	12 1/2
1	1 5/16	7 3/32	4	11	1 13/32	1 1/2	8 13/16	3 1/8	16
1 1/16	1 3/8	7 17/32	4 1/4	11 1/2	1 1/2	1 19/32	9 11/32	3 3/8	20
1 1/8	1 15/32	8	4 1/2	13	1 19/32	1 11/16	9 29/32	3 1/2	23
1 3/16	1 17/32	8 7/16	4 3/4	14 3/4	1 21/32	1 25/32	10 7/16	3 5/8	25
1 1/4	1 5/8	8 7/8	5	17 1/2	1 3/4	1 7/8	11	3 3/4	29 1/2
1 5/16	1 23/32	9 5/16	5 1/4	21	1 27/32	1 31/32	11 9/16	3 7/8	34
1 3/8	1 25/32	9 3/4	5 1/2	23	1 15/16	2 1/16	12 3/32	4	40
1 7/16	1 7/8	10 7/32	5 3/4	27	2	2 5/32	12 21/32	4 1/8	44
1 1/2	1 15/16	10 21/32	6	31	2 3/32	2 1/4	13 3/16	4 1/4	47
1 9/16	2 1/32	11 3/32	6 1/4	35	2 3/16	2 11/32	13 3/4	4 3/8	58
1 5/8	2 1/8	11 17/32	6 1/2	40	2 9/32	2 7/16	14 5/16	4 1/2	65
1 11/16	2 3/16	11 31/32	6 3/4	43	2 3/8	2 17/32	14 27/32	4 5/8	74
1 3/4	2 9/32	12 7/16	7	49	2 7/16	2 5/8	15 13/32	4 3/4	88
1 13/16	2 3/8	12 7/8	7 1/4	55	2 17/32	2 23/32	15 15/16	4 7/8	91 1/4
1 7/8	2 7/16	13 5/16	7 1/2	60	2 5/8	2 13/16	16 1/2	5	100
1 15/16	2 17/32	13 3/4	7 3/4	67	2 23/32	2 29/32	17 1/16	5 1/4	106
2	2 19/32	14 3/16	8	73	2 13/16	3	17 19/32	5 1/2	120
2 1/16	2 11/16	14 5/8	8 1/4	82	2 7/8	3 3/32	18 5/32	5 3/4	131
2 1/8	2 3/4	15 3/32	8 1/2	88 3/4	2 31/32	3 3/16	18 11/16	6	150
2 3/16	2 27/32	15 17/32	8 3/4	94	3 1/16	3 9/32	19 1/4	6 1/4	158
2 1/4	2 15/16	15 31/32	9	99	3 5/32	3 3/8	19 13/16	6 1/2	169
2 5/16	3	16 13/32	9 1/4	112	3 1/4	3 15/32	20 11/32	6 3/4	188
2 3/8	3 3/32	16 7/8	9 1/2	124	3 11/32	3 9/16	20 29/32	7	203
2 7/16	3 5/32	17 5/16	9 3/4	130	3 13/32	3 21/32	21 7/16	7 1/4	217
2 1/2	3 1/4	17 3/4	10	136	3 1/2	3 3/4	22	7 1/2	235
2 9/16	3 11/32	18 3/16	10 1/4	144	3 19/32	3 27/32	22 9/16	7 3/4	256
2 5/8	3 13/32	18 5/8	10 1/2	155	3 11/16	3 15/16	23 3/32	8	282
2 11/16	3 1/2	19 3/32	10 3/4	176	3 3/4	4 1/32	23 21/32	8 1/4	291
2 3/4	3 19/32	19 17/32	11	192	3 27/32	4 1/8	24 3/16	8 1/2	312
2 13/16	3 21/32	19 31/32	11 1/4	202	3 15/16	4 7/32	24 3/4	8 3/4	333
2 7/8	3 3/4	20 13/32	11 1/2	215	4 1/32	4 5/16	25 5/16	9	360
2 15/16	3 13/16	20 7/8	11 3/4	226	4 1/8	4 13/32	25 27/32	9 1/4	386
3	3 29/32	21 5/16	12	243	4 3/16	4 1/2	26 13/32	9 1/2	404

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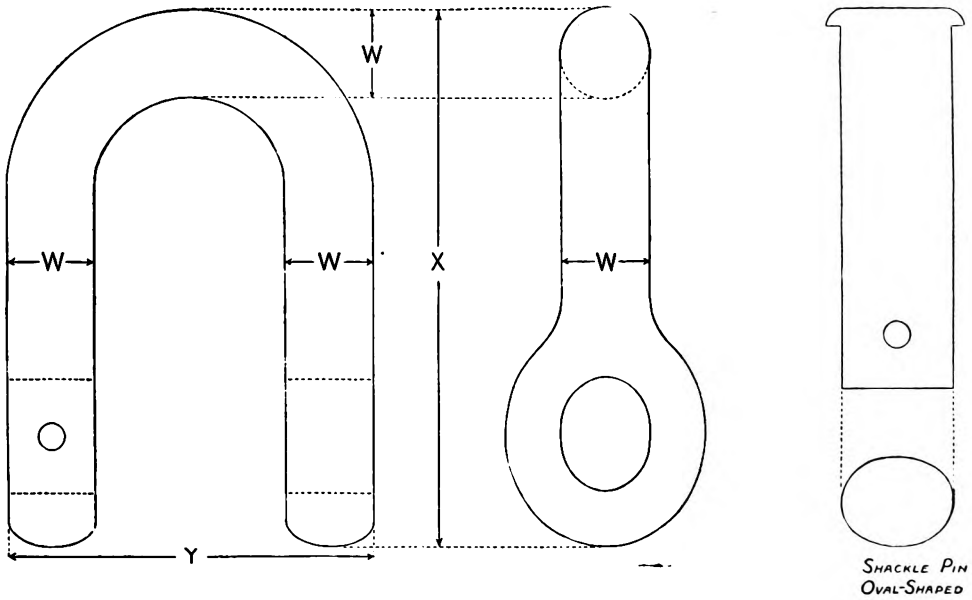
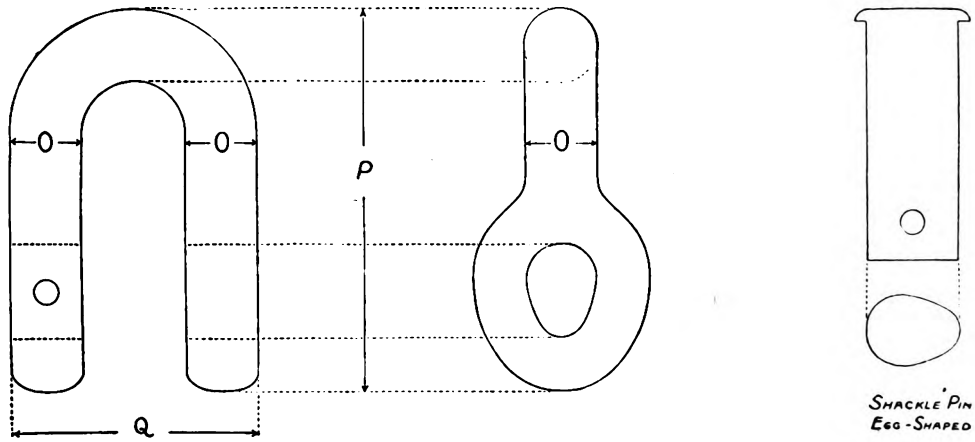
JOINING AND ANCHOR SHACKLES

To American Bureau of Shipping Specifications, Also Used on Cable Chain Made to American Chain Co.'s Private Test and Inspection

END OR ANCHOR SHACKLE—F



JOINING SHACKLE—D



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SHACKLES

DIMENSIONS AND WEIGHTS OF SHACKLES

Approved by American Bureau of Shipping, September, 1917.

Also Specifications of Shackles to American Chain Co.'s Test and Inspection

	Joining Shackles D				End of Anchor Shackles F			
Size of Cable on which Used in Inches	O Diameter of Shackle in Inches	P Length of Shackle Outside in Inches	Q Width of Shackle Outside in Inches	Approximate Weight Including Pin in Pounds	W Diameter of Shackle in Inches	X Length of Shackle Outside in Inches	Y Width of Shackle Outside in Inches	Approximate Weight Including Pin in Pounds
5/8	11/16	4 1/16	2 1/2	1 1/2	7/8	5 1/2	3 3/4	3 3/4
11/16	3/4	4 7/16	2 3/4	2 1/4	1	6	4 1/4	5
3/4	7/8	4 7/8	3	3 1/2	1 1/16	6 5/8	4 1/2	6 1/2
13/16	15/16	5 1/4	3 1/4	4	1 1/8	7 1/8	4 3/4	7 1/4
7/8	1	5 11/16	3 1/2	4 1/2	1 3/16	7 3/4	5 1/8	9 1/2
15/16	1 1/16	6 1/16	3 3/4	5 1/2	1 5/16	8 1/4	5 5/8	12 1/2
1	1 1/8	6 1/2	4	6 1/4	1 7/16	8 3/4	6	16 1/2
1 1/16	1 3/16	6 7/8	4 1/4	8	1 1/2	9 3/8	6 3/8	20
1 1/8	1 1/4	7 5/16	4 1/2	9 1/4	1 9/16	9 7/8	6 5/8	22
1 3/16	1 3/8	7 11/16	4 3/4	12	1 5/8	10 1/2	6 7/8	24
1 1/4	1 7/16	8 1/8	5	13 1/2	1 3/4	11	7 1/4	29 1/2
1 5/16	1 1/2	8 1/2	5 1/4	15 3/4	1 7/8	11 1/2	7 5/8	36
1 3/8	1 9/16	8 15/16	5 1/2	17	1 15/16	12 1/8	7 7/8	40
1 7/16	1 5/8	9 5/16	5 3/4	20	2	12 5/8	8 1/8	44
1 1/2	1 11/16	9 11/16	6	23	2 1/8	13 1/4	8 1/2	53
1 9/16	1 3/4	10 1/8	6 1/4	25	2 3/16	13 3/4	8 3/4	58
1 5/8	1 13/16	10 1/2	6 1/2	28	2 1/4	14 1/4	9	63
1 11/16	1 7/8	10 15/16	6 3/4	31	2 3/8	14 7/8	9 3/8	74
1 3/4	2	11 5/16	7	34	2 7/16	15 3/8	9 5/8	80
1 13/16	2 1/16	11 3/4	7 1/4	40	2 1/2	16	9 7/8	88
1 7/8	2 1/8	12 1/8	7 1/2	43	2 5/8	16 1/2	10 1/4	100
1 15/16	2 3/16	12 9/16	7 3/4	49	2 3/4	17	10 3/4	108
2	2 1/4	12 15/16	8	53	2 13/16	17 5/8	11 1/8	120
2 1/16	2 5/16	13 3/8	8 1/4	57	2 7/8	18 1/8	11 1/2	131
2 1/8	2 3/8	13 3/4	8 1/2	62	3	18 3/4	12	149
2 3/16	2 7/16	14 3/16	8 3/4	67	3 1/16	19 1/4	12 3/8	158
2 1/4	2 9/16	14 9/16	9	77	3 1/8	19 3/4	12 3/4	169
2 5/16	2 5/8	14 15/16	9 1/4	84	3 1/4	20 3/8	13 1/4	188
2 3/8	2 11/16	15 3/8	9 1/2	90	3 3/8	21	13 3/4	212
2 7/16	2 3/4	15 3/4	9 3/4	96	3 7/16	21 1/2	14 1/8	225
2 1/2	2 13/16	16 3/16	10	102	3 1/2	22	14 1/2	235
2 9/16	2 7/8	16 9/16	10 1/4	109	3 5/8	22 1/2	15	263
2 5/8	2 15/16	17	10 1/2	117	3 11/16	23 1/8	15 3/8	282
2 11/16	3	17 3/8	10 3/4	124	3 3/4	23 5/8	15 3/4	291
2 3/4	3 1/8	17 13/16	11	140	3 7/8	24 1/4	16 1/4	321
2 13/16	3 3/16	18 3/16	11 1/4	150	3 15/16	24 3/4	16 5/8	333
2 7/8	3 1/4	18 5/8	11 1/2	158	4	25 1/4	17	354
2 15/16	3 5/16	19	11 3/4	168	4 1/8	25 7/8	17 1/2	386
3	3 3/8	19 7/16	12	177	4 3/16	26 3/8	17 7/8	404
3 1/16	3 7/16	19 13/16	12 1/4	186	4 1/4	27	18 1/4	423
3 1/8	3 1/2	20 1/4	12 1/2	197	4 3/8	27 1/2	18 5/8	461
3 3/16	3 9/16	20 5/8	12 3/4	208	4 1/2	28	19 1/8	501
3 1/4	3 5/8	21	13	219	4 9/16	28 5/8	19 1/2	524
3 5/16	3 3/4	21 7/16	13 1/4	243	4 5/8	29 1/4	20	542
3 3/8	3 13/16	21 13/16	13 1/2	255	4 11/16	29 3/4	20 3/8	564
3 7/16	3 7/8	22 1/4	13 3/4	268	4 13/16	30 1/4	20 3/4	611
3 1/2	3 15/16	22 5/8	14	281	4 15/16	30 3/4	21 1/4	661
3 3/4	4 1/4	24 1/4	15	351	5 1/4	33	23	799

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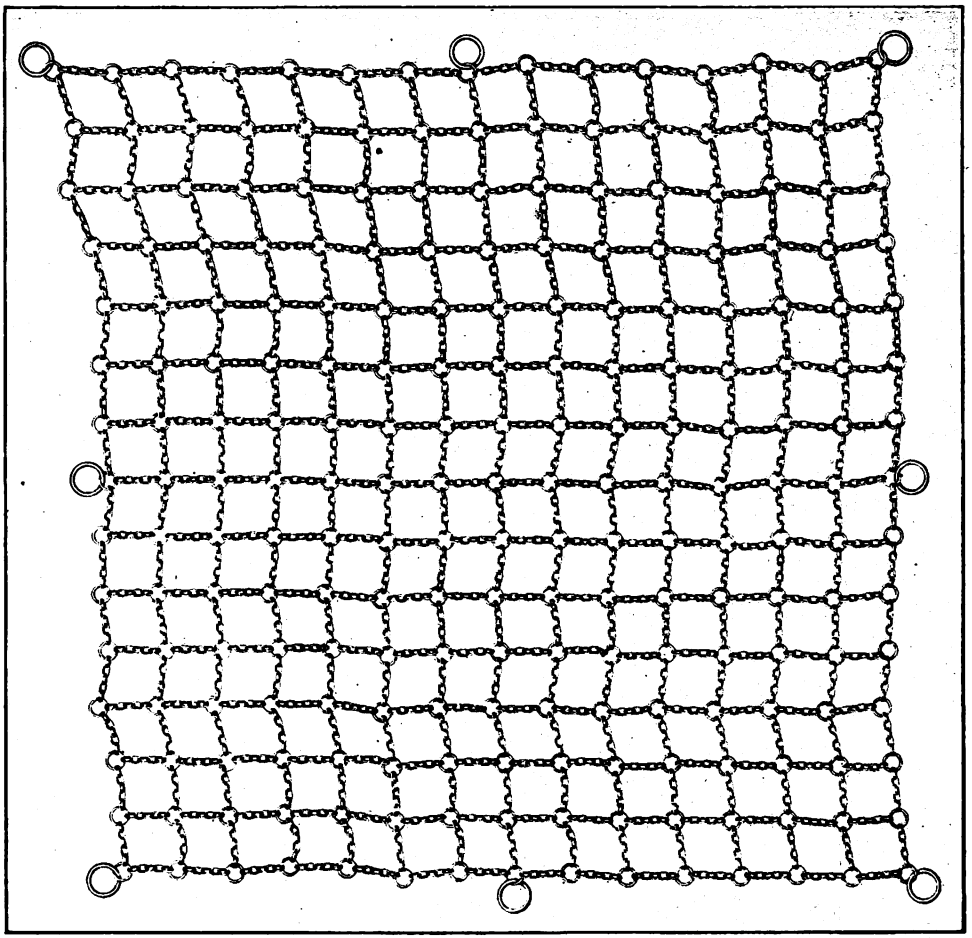
CARGO NETS

FOR GENERAL SHIPS' USE



Made in any size or shape desired. Regular sizes and dimensions are as follows: Chain ¼, $\frac{5}{16}$ and ⅜ in., mesh 7 in. square, complete net 8x8, 9x9 and 10x10 ft. square. Prices on request.

In ordering, indicate the size of net required by giving the length and width in feet, state the size chain and mesh wanted. Nets will be furnished self color unless ordered blacked.

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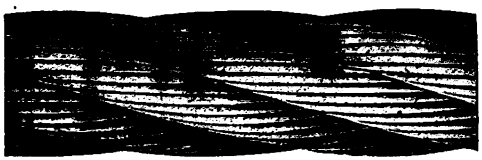
WIRE ROPE

LAY OF WIRE ROPE

Right Hand Regular Lay

Left Hand Regular Lay

In the regular lay, the wires of the strands are twisted in one direction and the strands are laid into the rope in the opposite direction.



Lang's Lay

In this lay, wires and strands in rope are twisted in the same direction.

Non-Rotating or Reverse Lay

In this lay the alternate strands are made regular and Lang's lay.

SOME POINTS ON WIRE ROPE

The extensive use of wire rope is of comparatively recent origin.

To obtain maximum service from wire rope, it must be properly adapted for the use intended, and proper care should be had in designing machinery and equipment suited to its installation.

The highest priced rope may or may not be the most economical. It depends on suitability for the particular work to be done. Soft iron rope is more pliable than harder steel rope; conversely steel rope stands higher tensile strain.

Coarser wires offer more surface resistance to frictional wear, consequently, are preferred for haulage purposes. They are less pliable, and so require larger drums and sheaves to insure long life.

Testing a completed wire rope is not sufficient to determine its quality. Before the rope is laid up, the individual wires must be tested as to strength, pliability, torsion, toughness and per cent of carbon, to show the composition of the rope.

Wire ropes should not overlap on a drum. Under strain this tends to crush the rope out of shape, and puts unequal loads on the several wires.

In laying out a plant, care should be taken to arrange all bends of wire rope in one plane. Successive bends in different planes tend to unlay the rope and destroy it.

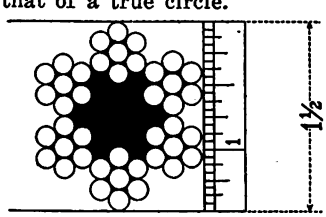
Bright or ungalvanized wire rope should be treated with some good compound to protect it from corrosion and the chemical action of acids, sulphur, etc., to which it may be exposed.

U-W Wire Rope Dressing is made especially for this service.

Watch your ropes. They do not give out all at once.

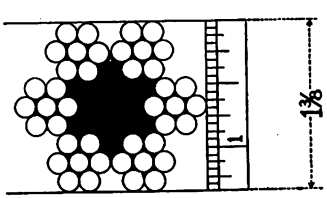
MEASURING WIRE ROPE

The right and wrong ways to measure wire rope. The diameter of a wire rope is that of a true circle.



Right way to measure
(a true circle)

The diameter of a wire rope is that of a circle enclosing the rope. Care should be taken in measuring to obtain this diameter. If a rope is measured the wrong way (see diagram), and a wheel is ordered grooved to take the rope, the groove would be too small.



Wrong way to measure
(not a true circle)

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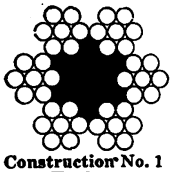
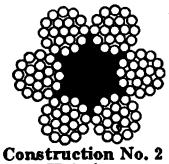
WIRE ROPE

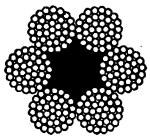
CONSTRUCTION OF STANDARD TYPES OF WIRE ROPE



Construction No. 1
Haulage
6 x 7

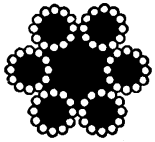


Construction No. 2
Hoisting
6 x 19



Construction No. 3
Flexible Hoisting
6 x 37

Construction No. 4
Flexible Hoisting
8 x 19

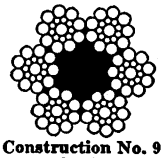


Construction No. 5
Running Rope
6 x 12

Construction No. 6
Hawser and Mooring
6 x 24
Line

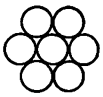
Construction No. 7
Rigging or Guy Rope
6 x 12

Construction No. 8
6 x 8

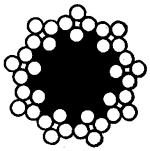


Construction No. 9
6 x 19
Seale Lay
9 over 9 over 1

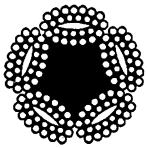
Construction No. 10
Tiller Rope
6 x 6 x 7



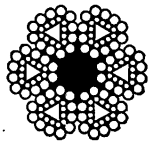
Construction No. 11
Galvanized Strand
7 Twisted Wires



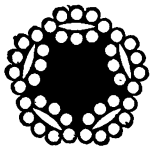
Construction No. 12
Mast Arm or Electric
Light Rope
9 x 4



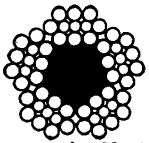
Construction No. 13
5 x 28
Type A



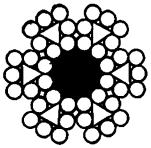
Construction No. 14
6 x 25
Type B



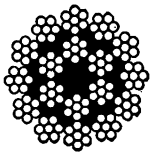
Construction No. 15
5 x 9
Type C



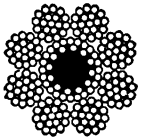
Construction No. 16
5 x 11
Type D



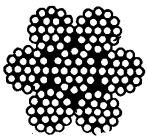
Construction No. 17
6 x 8
Type E



Construction No. 18
12 x 7 Right over
6 x 7 Left



Construction No. 19
8 x 19 Right over
12 x 3 Left



Construction No. 20
7 x 19
Wire Center

Construction No. 1 permits largest gauge of wire for a given diameter of rope and is preferable for drilling cables, sand lines, transmission and mine haulage. It will also answer for hoisting purposes if drums or sheaves are large enough.

Construction No. 2 is adapted for general hoisting purposes and is adapted to smaller drums than construction No. 1.

Construction No. 3 is more flexible and permits use of smaller drums than No. 2.

Construction No. 4 is extra flexible, for use on very small drums and sheaves.

Construction No. 10 is the most flexible of any, used for the operation of elevators, steering gears, etc., where great pliability is essential. It is not suitable for use under heavy loads or where there is much outside wear.

Constructions Nos. 13, 14, 15, 16 and 17 are designed to give more wearing surface than is to be obtained from a round strand rope.

Constructions Nos. 18 and 19 are non-rotating, for use in mine hoists where the bucket or cage swings free without guides on single line derricks. They are designed so that there will be no tendency to twist when subjected to a direct strain.

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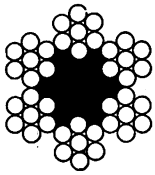
WIRE ROPE

HAULAGE ROPE

Construction No. 1. Six Strands, 7 Wires Each, Hemp Center



Diameter in Inches	Swedes Iron Per Foot	Crucible Cast Steel Per Foot	Extra Strong Crucible Cast Steel (Mild Plow) Per Foot	Plow Steel Per Foot	Perfection Steel Per Foot
1/4	$0.03	$0.04	$0.05	$0.05½	....
9/32	.03¼	.04	.05	.05½	....
5/16	.03¾	.04½	.05½	.06	....
3/8	.04½	.05½	.06	.06¾	$0.08¾
7/16	.05½	.06½	.07½	.09	.11½
1/2	.06½	.08	.09½	.11½	.13½
9/16	.08¼	.10	.12	.14½	.17
5/8	.10	.12	.14¼	.17½	.20½
11/16	.12	.14½	.17	.21	.24½
3/4	.14	.17	.20	.24½	.28½
13/16	...	.18	....	....	....
7/8	.18½	.22½	.27	.32	.37
1	.24	.29	.35	.41	.48
1⅛	.30	.36	.44	.51	.58
1¼	.36	.43	.53	.62	.72
1⅜	.43	.51	.64	.76	.88
1½	.51	.60	.75	.90	1.05

For Wire Center, add 10%

List price on 6 x 8 (Construction No. 8) half way between above list and 6 x 19 list (see next page).

COMPARATIVE STRENGTH AND WEIGHT

Diameter in Inches	Weight Per 100 Feet in Pounds	Approximate Strength in Tons: Iron	Crucible Cast Steel	Extra Strong Crucible Cast Steel (Mild Plow)	Plow Steel	Perfection Steel
1/4	10	1.1	2.2	2.75	3	....
9/32	12½	1.25	2.75	3	3.4	....
5/16	15	1.5	3.5	4	4.4	....
3/8	22	2.4	5	5.25	5.9	6.5
7/16	30	3	6.5	6.25	7	7.75
1/2	39	4	8.5	9	10	11
9/16	50	4.7	10	11	12	13
5/8	60	6	12.5	14.50	16	17.5
11/16	75	7.5	15	16.75	18	20
3/4	90	8.5	18.5	21	23	25
13/16	105	10	20	24	27	29
7/8	120	12	24	28	31	33
1	160	15	31	35	38	42
1⅛	200	19	38	43	47	52
1¼	250	23	47	54	60	67
1⅜	300	30	56	65	72	80
1½	350	35	64	75	82	90

Proper working load is 20% of approximate strength

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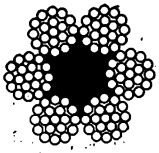
WIRE ROPE

HOISTING ROPE

Construction No. 2. Six Strands, 19 Wires Each, Hemp Center



Diameter in Inches	Swedes Iron Per Foot	Crucible Cast Steel Per Foot	Extra Strong Crucible Cast Steel (Mild Plow) Per Foot	Plow Steel Per Foot	Perfection Steel Per Foot
¼	$0.06½	$0.09	$0.10½	$0.12	$0.13
5/16	.06¾	.09¼	.10¾	.12¼	.13½
⅜	.07	.09½	.11	.12½	.14½
7/16	.07½	.10	.11½	.13	.15½
½	.08½	.11	.12½	.14	.17
9/16	.10	.12	.14	.16	.19
⅝	.12	.14	.16½	.19	.22½
¾	.16	.19	.22	.26	.31
⅞	.20	.24	.29	.34	.39
1	.26	.31	.37	.43	.50
1⅛	.33	.38	.46	.54	.62
1¼	.40	.46	.56	.65	.75
1⅜	.49	.56	.68	.79	.90
1½	.57	.66	.80	.93	1.10
1⅝	.65	.77	.94	1.08	1.30
1¾	.80	.90	1.10	1.30	1.60
1⅞	.88	1.02	1.25	1.46	1.75
2	.95	1.16	1.34	1.58	1.85
2¼	1.17	1.44	1.70	2.00	2.50
2½	1.40	1.75	2.10	2.50	2.80
2¾	1.70	2.10	2.55	3.00	3.45

For Wire Center, add 10%

COMPARATIVE STRENGTH AND WEIGHT

Diameter in Inches	Weight Per 100 Feet in Pounds	Approximate Strength in Tons: Swedes Iron	Crucible Cast Steel	Extra Strong Crucible Cast Steel (Mild Plow)	Plow Steel	Perfection Steel
¼	10	1.1	2.2	2.45	2.75	3.25
5/16	15	1.5	3.1	3.50	3.75	4.5
⅜	22	2.4	5	5.30	5.75	6.75
7/16	30	2.9	6.5	7.25	8	9.4
½	38	3.9	8.4	9.25	10	12.1
9/16	50	4.7	10	11.25	12.3	14.5
⅝	65	6	12.5	14.00	15.5	19
¾	86	8.5	17.5	20.25	23	26.3
⅞	120	11.8	23	26	29	35
1	155	14.5	30	34	38	45
1⅛	200	18.6	38	44	47	56
1¼	250	22.8	47	54	58	69
1⅜	300	28	56	64	72	84
1½	360	33	64	74	82	100
1⅝	410	38	72	85	94	110
1¾	480	44	85	100	112	135
1⅞	560	50	96	112	127	150
2	625	55	106	125	140	165
2¼	800	72	133	160	186	210
2½	985	92	170	200	230	265
2¾	1200	110	210	250	275	315

Proper working load is 20% of approximate strength

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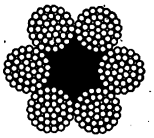
WIRE ROPE

BRIGHT SPECIAL FLEXIBLE STEEL HOISTING ROPE

Construction No. 3. Six Strands, 37 Wires Each, Hemp Center



Diameter in Inches	Crucible Cast Steel Per Foot	Extra Strong Crucible Cast Steel (Mild Plow) Per Foot	Plow Steel Per Foot	Perfection High Strength Plow Steel Per Foot
3/8	$0.12	$0.13	$0.15	$0.17½
7/16	.12½	.14	.16	.18½
1/2	.13	.15	.17	.20
9/16	.15	.17½	.20	.23
5/8	.18	.21	.24	.27
3/4	.23	.27	.31	.36
7/8	.28	.34	.40	.46
1	.37	.44	.51	.59
1 1/8	.46	.55	.64	.75
1 1/4	.55	.65	.75	.86
1 3/8	.65	.78	.91	1.05
1 1/2	.79	.95	1.10	1.25
1 5/8	.89	1.07	1.25	1.45
1 3/4	1.05	1.28	1.50	1.75
1 7/8	1.20	1.41½	1.65	1.92½
2	1.35	1.55	1.80	2.10
2 1/4	1.60	1.90	2.20	2.50
2 1/2	1.92	2.35	2.75	3.15
2 3/4	2.30	2.80	3.30	3.75

Ropes 2 inches and larger furnished with six strands, 61 wires each. Prices on application

For Wire Center, add 10%

COMPARATIVE STRENGTH AND WEIGHT

Diameter in Inches	Weight Per 100 Feet in Pounds	Approximate Strength in Tons: Crucible Cast Steel	Extra Strong Crucible Cast Steel (Mild Plow)	Plow Steel	Perfection Plow Steel
3/8	22	4.25	4.65	5	5.30
7/16	30	5.50	6.35	7.25	7.50
1/2	40	7.25	8.25	9.25	9.75
9/16	50	9.50	10.50	11.50	12.50
5/8	62	11.25	12.50	14	16
3/4	90	17.50	19	21	23
7/8	120	23	25	27	30
1	160	30	32	35	37
1 1/8	200	35	40	45	46
1 1/4	250	45	50	55	58
1 3/8	300	55	60	68	70
1 1/2	350	65	70	80	85
1 5/8	420	72	80	90	95
1 3/4	485	85	95	108	115
1 7/8	555	94	105	119	125
2	625	105	120	130	140
2 1/4	800	125	150	175	185
2 1/2	1000	160	190	215	225
2 3/4	1200	200	235	265	280

Proper working load is 20% of approximate strength

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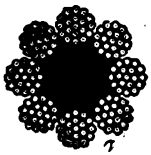
WIRE ROPE

EXTRA FLEXIBLE HOISTING ROPE

Construction No. 4

Eight Strands, 19 Wires Each, Hemp Center



Diameter, in Inches	Crucible Cast Steel Per Foot	Extra Strong Crucible Cast Steel (Mild Plow) Per Foot	Plow Steel Per Foot	Perfection Plow Steel Per Foot
¼	$0.10	$0.11¾	$0.13¼	....
5/16	.10¼	.12	.13½	....
⅜	.10½	.12¼	.14	....
7/16	.11	.13	.15	....
½	.12	.14	.16	$0.19
9/16	.14	.16	.18	.22
⅝	.16	.18½	.21	.25
¾	.21	.25	.29	.34
⅞	.27	.32	.38	.43
1	.34	.41	.48	.55
1⅛	.42	.51	.60	.68
1¼	.51	.62	.72	.82
1⅜	.62	.75	.87	.98
1½	.73	.88	1.03	1.19

When Galvanized, not subject to Bright Wire Rope Discount

COMPARATIVE STRENGTH AND WEIGHT

Diameter in Inches	Weight Per 100 Feet in Pounds	Approximate Strength in Tons: Crucible Cast Steel	Crucible Cast Steel (Mild Plow) Extra Strong	Plow Steel	Perfection Plow Steel
¼	9	1.8	2	2.25	..
5/16	13	2.75	3	3.35	..
⅜	20	4.2	4.75	5.10	..
7/16	27	5.7	6.40	7	..
½	35	7.3	8	8.75	10
9/16	45	8.7	10	11.60	12
⅝	56	10.9	12.50	14	15
¾	80	15.3	17.50	20	22
⅞	108	20	23	26	28
1	142	26	30	33	36
1⅛	180	34	38	43	46
1¼	220	42	48	52	56
1⅜	270	51	60	65	70
1½	320	58	70	75	80

Proper working load is 20% of approximate strength

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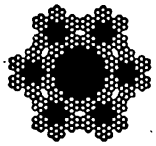
WIRE ROPE

BRIGHT TILLER ROPE

Charcoal Iron and Crucible Steel, Construction No. 10

Six Ropes, Each Six Strands of Seven Wires, Seven Hemp Centers



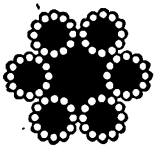
Diameter in Inches	Approximate Weight Per 100 Feet in Pounds	List Price Iron	Approximate Strength in Tons	List Price Crucible Steel	Approximate Strength in Tons
3/16	4	$0.07½	.75	$0.11	1.50
¼	7	.07½	1	.11	2
5/16	11	.08	1.25	.12½	2.75
⅜	16	.09	2	.14	4
7/16	21	.10	2.50	.15	5.75
½	28	.11½	3.50	.17	7.50
9/16	35	.14	4	.20	9
⅝	43	.17	5.25	.24	11
¾	62	.22	7.50	.30	15
⅞	84	.27	10.50	.36	20
1	110	.33	12.50	.43	25
1⅛	140	.40	17.50	.52	34

Elevator Hand Ropes are usually of this construction, in sizes ⅜, 7/16 and ½ inch.
Galvanized Tiller Rope list 10% higher.

GALVANIZED IRON AND CRUCIBLE STEEL RUNNING ROPE

Construction No. 5

Six Strands, 12 Wires Each, Seven Hemp Centers



Diameter in Inches	List Price Iron	Approximate Strength in Tons	List Price Crucible Steel	Approximate Strength in Tons	Approximate Weight Per 100 Ft. in Pounds
5/16	$0.05½	.80	$0.07	2.00	10
⅜	.06	1.30	.07¾	2.85	14
7/16	.06½	1.70	.08½	4.00	20
½	.07	2.25	.09	5.00	26
9/16	.08	2.80	.11	6.50	33
⅝	.10	3.60	.14	8.00	42
¾	.12	5.00	.16½	11.50	60
13/16	.14½	6.00	.20	13.50	68
⅞	.17	7.00	.23	15.50	80
1	.20	8.75	.27	20.00	105
1 1/16	.22	10.00	.30	22.50	120

In ordering, please specify whether iron or crucible steel is desired

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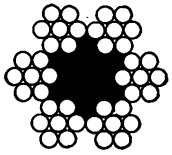
WIRE ROPE



GALVANIZED IRON ROPE
For Guys and Ships' Rigging

Construction No. 1
Six Strands, Seven Wires Each, Hemp Center

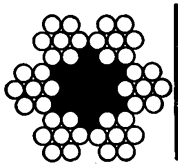
Diameter in Inches	Circumference in Inches	Weight Per 100 Ft. in Pounds	Approximate Strength in Tons	Price Per Foot
1/4	3/4	9	1	$0.03
5/16	1	15	1.5	.04 1/4
3/8	1 1/8	22	2	.04 1/2
7/16	1 1/4	30	2.4	.05
1/2	1 1/2	39	3.4	.06
9/16	1 3/4	50	4.5	.07
5/8	2	62	5.9	.08
3/4	2 1/4	89	7.8	.09
13/16	2 1/2	100	9.4	.11
7/8	2 3/4	120	11.1	.13
1	3	158	14.1	.15
1 1/16	3 1/4	177	16.1	.17 1/2
1 1/8	3 1/2	200	18	.19 1/2

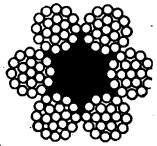
Construction No. 7
Six Strands, 12 Wires Each, Hemp Center

Diameter in Inches	Circumference in Inches	Weight Per 100 Ft. in Pounds	Approximate Strength in Tons	Price Per Foot
1	3	160	15	$0.16
1 1/16	3 1/4	177	17	.18 1/2
1 1/8	3 1/2	200	18.2	.21
1 3/16	3 3/4	225	20	.24
1 1/4	4	245	23	.26 1/2
1 3/8	4 1/4	300	26	.30 1/2
1 7/16	4 1/2	325	28	.33 1/2
1 1/2	4 3/4	360	30	.37
1 5/8	5	415	35	.40
1 11/16	5 1/4	440	38	.43
1 3/4	5 1/2	485	42	.46
2	6	575	50	.52
Five strands, 7 wires each				
1/4	3/4	9	1	$0.02 1/2
9/32	7/8	12 1/2	1.2	.03

For Wire Center, add 10%

GALVANIZED CRUCIBLE STEEL YACHT RIGGING AND GUY ROPE





Six Strands, Seven Wires Each, One Hemp Center
Six Strands, 19 Wires Each, One Hemp Center

Diameter in Inches	Approximate Weight Per 100 Feet in Pounds	Approximate Strength in Tons	List Price Per Foot 6 x 7	List Price Per Foot 6 x 19
5/16	15	3.2	$0.04 3/4	$0.10
3/8	22	4.2	.06	.10 1/4
7/16	30	5	.07	.11
1/2	39	7	.08 3/4	.12
9/16	50	9	.11	.13
5/8	62	11.7	.13	.15 1/4
3/4	89	16.8	.18 1/2	.20 3/4
13/16	103	19	.22	.23 1/2
7/8	120	22	.24 3/4	.26 1/4
1	158	28	.31 3/4	.34
1 1/16	177	31	.35	.38
1 1/8	200	34	.39 1/2	.41 3/4
1 3/16	221	38	.44	.46
1 1/4	245	42	.47	.50

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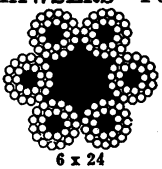
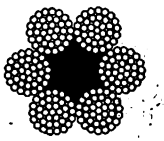
WIRE ROPE

GALVANIZED STEEL WIRE HAWSERS—For Towing, Mooring and Wrecking

6 x 12



6 x 24



6 x 37

Constructions Nos. 5, 6 and 3

Diameter in Inches	Circumference in Inches	List Price 6 x 12	List Price 6 x 24	List Price 6 x 37
¾	2¼	$0.16½	$0.22	$0.23
13/16	2½	.20	.25	.26
⅞	2¾	.28	.29	.31
1	3	.27	.35	.37
1 1/16	3¼	.30	.40	.42
1⅛	3½		.45	.48
1 3/16	3¾		.51	.54
1¼	4		.57	.60
1⅜	4¼		.62	.65
1 7/16	4½		.67	.71
1½	4¾		.73	.77
1⅝	5		.80	.84
1 11/16	5¼		.86	.91
1¾	5½		.93	.98
1 13/16	5¾		1.00	1.05
1⅞	5¾		1.00	1.12
1 15/16	6		1.06	1.12
2	6¼		1.14	1.20
2 1/16	6½			1.28
2⅛	6¾			1.35
2¼	7			1.44
2 5/16	7¼			1.52
2⅜	7½			1.60

Larger sizes furnished on application.

Larger sizes furnished on application.

Comparative Strength and Weight

Diameter in Inches	6 x 12 Weight Per 100 Feet	6 x 12 Strength in Tons	6 x 24 Weight Per 100 Feet	6 x 24 Tested to Tons	6 x 37 Weight Per 100 Feet	6 x 37 Strength in Tons
¾	55	12½	75	15	90	20
13/16	68	14½	90	19	100	22
⅞	80	16½	105	23	120	26
1	95	21½	138	27	160	26
1 1/16	115	24	154	30	178	38
1⅛	130	27	175	35	200	42
1 3/16	150	29	193	40	225	47
1¼	165	32	215	45	245	54
1⅜	195	39	260	50	300	66
1 7/16	215	42	290	55	325	72
1½	240	45	310	63	360	76
1⅝		....	360	75	400	87
1 11/16		....	385	77	440	97
1¾		....	425	82	485	104
1 13/16		....	450	88	515	112
1⅞		....	475	93	...	...
1 15/16		....	510	98	585	125
2		....	560	115	630	132
2 1/16		....	580	...	665	140
2⅛		....	...	...	710	155
2¼		....	...	...	800	171
2 5/16		....	...	...	840	182
2⅜		....	...	...	890	190

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WIRE ROPE

GALVANIZED MAST-ARM OR ELECTRIC LIGHT ROPE

[redacted]

Nine Strands, Four Wires Each, Hemp Center, Construction No. 12

Diameter in Inches	Weight Per 100 Feet in Pounds	Approximate Strength in Pounds	Price Per Foot
¼	7	1100	$0.02¾
5/16	11	1700	.03½
⅜	16	2300	.05

WIRE SASH CORD

[redacted]

Six Strands, Seven Wires Each, Hemp Center

Diameter in Inches	Weight Per 100 Feet in Pounds	Approximate Strength in Pounds	Price Per Foot Bright	Per Foot Galvanized or Tinned
3/16	.6	250	$0.01¼	$0.01¾
3/32	1.4	500	.01½	.02
⅛	2.5	800	.01¾	.02¼
5/32	3.7	1100	.02	.02¾
3/16	5.6	1425	.02¼	.03
7/32	7.5	1800	.02¾	.03½
¼	10.	2200	.03	.04

This cord is made to combine flexibiliy with good wearing qualities. Commonly used for steamboat whistle cord.

WIRE SASH CORD

Construction No. 1
Copper and Phosphor-Bronze
Six Strands, Seven Wires Each, One Hemp Center

Diameter in Inches	Approximate Weight Per 100 Feet	Approximate Strength in Pounds	List Price Per Foot Copper
1/16	.7	140	$0.03
3/32	1.6	275	.03½
⅛	2.9	435	.04½
5/32	3.8	600	.05½
3/16	6.5	800	.06
7/32	8.7	1025	.07½
¼	11.5	1275	.09

Diameter in Inches	Approximate Weight Per 100 Feet	Approximate Strength in Pounds	List Price Per Foot Phosphor Bronze
1/16	.7	300	$0.02½
3/32	1.6	500	.03
⅛	2.9	600	.04
5/32	3.8	800	.05
3/16	6.5	1000	.06
7/32	8.7	1200	.08
¼	11.5	1500	.10

PHOSPHOR-BRONZE WIRE HOISTING ROPE

Construction No. 2
Six Strands, 19 Wires Each, Hemp Center

Diameter in Inches	Approximate Strength in Pounds	Proper Working Load in Pounds	List Price Per Foot
⅛	500	50	$0.06
3/16	1000	100	.08
¼	1800	180	.12
5/16	3000	300	.15
⅜	5000	500	.22
7/16	6500	650	.26
½	8000	1000	.33
⅝	12000	2000	.50
¾	18000	3500	.70

PHOSPHOR-BRONZE WIRE TILLER ROPE

Construction No. 10
With Cotton and Hemp Centers

Diameter in Inches	Approximate Breaking Strain in Pounds	Number of Wires	List Price Per Foot
⅛	500	*114	$0.06
3/16	1000	*114	.08
¼	1500	252	.15
5/16	2000	252	.18
⅜	3500	252	.22
7/16	4500	252	.26
½	6000	252	.32
⅝	8000	252	.43
¾	11000	252	.60

PHOSPHOR-BRONZE WIRE RIGGING OR TRANSMISSION ROPE

Diameter in Inches	Approximate Strength in Pounds	Proper Working Load in Pounds	List Price Per Foot
¼	1500	250	$0.10
5/16	2500	400	.14
⅜	4500	800	.20
7/16	6000	1000	.25
½	8000	1500	.32
⅝	12000	2000	.50
¾	18000	4500	.70

Larger sizes and ropes with wire centers furnished. Prices on application.

*NOTE—The ⅛ in. and 3/16 in. rope for tillers is the same construction as hoisting rope, as in tiller lay the wires would be too fine to give durability.

Special Steel Cords of all constructions furnished. Prices on application.

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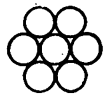
WIRE ROPE

GALVANIZED STRAND

Construction No. 11—Seven Steel Wires Twisted into a Single Strand



Standard Steel Strand
Single or Double Galvanized

Diameter in Inches	Weight Per 100 Feet Pounds	Strength in Pounds	List Price Per 100 Feet
3/32	2	400	$0.80
1/8	3	500	1.00
5/32	5	900	1.15
3/16	8	1400	1.25
1/4	13	2300	1.75
5/16	22	3800	2.50
3/8	30	5000	3.50
7/16	40	6500	4.50
1/2	52	8500	5.50
9/16	65	11000	7.00
5/8	80	14000	8.50
3/4	120	18000	14.00
7/8–19 wires	160	24000	20.70

High Strength Strand
Double Galvanized

Diameter in Inches	Weight Per 100 Feet Pounds	Strength in Pounds	List Price Per 100 Feet
1/8	4	1500	$1.20
3/16	8	3300	1.80
1/4	13	5100	2.25
5/16	22	8100	3.20
3/8	30	11500	4.40
7/16	40	15000	6.00
1/2	52	18000	7.25
5/8	76	25000	12.00

Siemens-Martin Strand
Double Galvanized

Diameter in Inches	Weight Per 100 Feet Pounds	Strength in Pounds	List Price Per 100 Feet
1/8	4	900	$0.90
3/16	8	2000	1.35
1/4	13	3060	1.70
5/16	22	4860	2.50
3/8	30	6800	3.25
7/16	40	9000	4.30
1/2	52	11000	5.25
5/8	76	19000	8.25

Siemens-Martin strand affords greater strength than standard quality and is used to sustain telephone cables, and for other purposes of like character.

Extra High Strength Strand
Double Galvanized

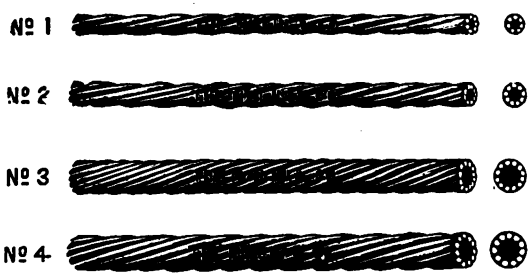
Diameter in Inches	Weight Per 100 Feet Pounds	Strength in Pounds	List Price Per 100 Feet
1/8	4	2250	$1.60
3/16	8	4900	2.40
1/4	13	7600	2.85
5/16	22	12100	4.25
3/8	30	17250	5.25
7/16	40	22500	7.20
1/2	52	27000	8.80
5/8	76	42500	14.60

Galvanized Seizing Strand

Diameter in inches	11/64	9/64	1/8	3/32
Seven wires of No.	18	19	20	21
Weight per 1000 feet, lbs.	50	37	30	25
Per pound	$0.18	.19	.20	.21

GALVANIZED CLOTHES LINE

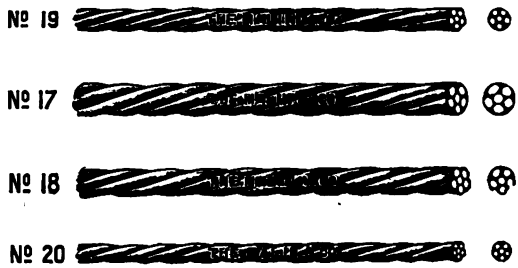
Hollow Cable



Estimated number of 100 ft. clothes lines per barrel:

Nos.	1	2	3	4	17	18	19	20
Dozen	22	15	10	8	9	11	13	16

Solid Cable



All numbers—40, 50, 60, 75, 100, 150 ft. coils and 500, 1000, 1500, 2000 ft. reels. Prices on application.

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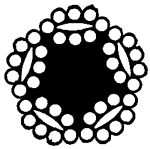
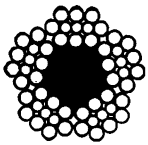
WIRE ROPE

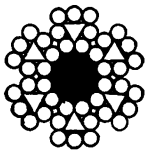
FLATTENED STRAND STEEL WIRE HAULAGE OR TRANSMISSION ROPE



Type C
Five Strands,
Nine Wires Each,
One Hemp Center



Type D
Five Strands,
Eleven Wires Each,
One Hemp Center



Type E
Six Strands,
Eight Wires Each,
One Hemp Center

Constructions Nos. 15, 16 and 17

Diameter in Inches	Weight Per 100 Feet: Types C and D	Weight Per 100 Feet: Type E	List Price Per Foot: Crucible Cast Steel	List Price Per Foot: Extra Strong Crucible Cast Steel	List Price Per Foot: Perfection Plow Steel
⅜	23	25	$0.07	$0.11	.....
½	40	45	.10	.14	$0.16¼
⅝	64	72	.14	.18	.25
¾	92	100	.20½	.27	.35
⅞	124	138	.27½	.35	.44
1	165	180	.35	.45	.58
1⅛	205	230	.45	.54	.70
1¼	255	280	.54	.68	.88
1⅜	310	345	.64	.80	.....
1½	365	400	.75	.93	.....

For Wire Center for Type E, add 10%

APPROXIMATE STRENGTH IN TONS

Diameter in Inches	Crucible Cast Steel: Types C and D	Crucible Cast Steel: Type E	Extra Strong Crucible Cast Steel: Types C and D	Extra Strong Crucible Cast Steel: Type E	Perfection Plow Steel: Types C and D	Perfection Plow Steel: Type E
⅜	4.6	5	5.25	5.7	....	....
½	7.7	8.3	8.85	9.6	11	11.9
⅝	13	14	14.5	15.7	17½	19
¾	18.6	20	21	22.7	25	27
⅞	24	26	28	30	33	36
1	31	34	35	38	42	46
1⅛	37	40	43	46	52	56
1¼	46	50	54	58	67	73
1⅜	53	57	63	68	....	....
1½	63	68	73	79	....	....

Proper working load averages 20% of approximate strength

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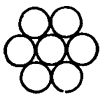
WIRE ROPE

GALVANIZED STRAND

Construction No. 11—Seven Steel Wires Twisted into a Single Strand



Standard Steel Strand
Single or Double Galvanized

Diameter in Inches	Weight Per 100 Feet Pounds	Strength in Pounds	List Price Per 100 Feet
3/32	2	400	$0.80
1/8	3	500	1.00
5/32	5	900	1.15
3/16	8	1400	1.25
1/4	13	2300	1.75
5/16	22	3800	2.50
3/8	30	5000	3.50
7/16	40	6500	4.50
1/2	52	8500	5.50
9/16	65	11000	7.00
5/8	80	14000	8.50
3/4	120		14.00
7/8—19 wires	160		20.70

Siemens-Martin Strand
Double Galvanized

Diameter in Inches	Weight Per 100 Feet Pounds	Strength in Pounds	List Price Per 100 Feet
1/8	4	900	$0.90
3/16	8	2000	1.35
1/4	13	3060	1.70
5/16	22	6000	2.50
3/8	30	6800	3.25
7/16	40	9000	4.30
1/2	52	11000	5.25
5/8	76	19000	8.25

Siemens-Martin strand affords greater strength than standard quality and is used to sustain telephone cables, and for other purposes of like character.

High Strength Strand
Double Galvanized

Diameter in Inches	Weight Per 100 Feet Pounds	Strength in Pounds	List Price Per 100 Feet
1/8	4	1500	$0.80
3/16	8	3300	1.30
1/4	13	5100	1.50
5/16	22	8100	2.10
3/8	30	11500	2.70
7/16	40	15000	3.45
1/2	52	18000	3.95
5/8	76	25000	6.25

Extra High Strength Strand
Double Galvanized

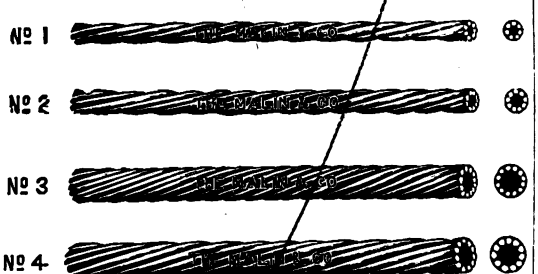
Diameter in Inches	Weight Per 100 Feet Pounds	Strength in Pounds	List Price Per 100 Feet
1/8	4	2250	$1.05
3/16	8	4900	1.60
1/4	13	7600	1.90
5/16	22	12100	2.70
3/8	30	17250	3.55
7/16	40	22500	4.60
1/2	52	27000	5.50
5/8	76	42000	8.75

Galvanized Seizing Strand

Diameter in inches	11/64	3/64	1/8	3/32
Seven wires of No	18	19	20	21
Weight per 1000 feet, lbs	50	37	30	25
Per pound	$0.18	.19	.20	.21

GALVANIZED CLOTHES LINE

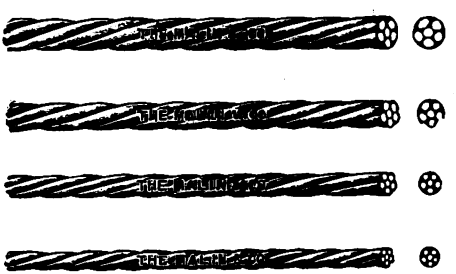
Hollow Cable



Estimated number of 100 ft. clothes lines per barrel:

Nos.	1	2	3	4	17	18	19	20
Dozen	19	15	10	8	9	11	12	16

Solid Cable



All numbers—40, 50, 60, 75, 100, 150 ft. coils and 500, 1000, 1500, 2000 ft. reels.

Prices on application.

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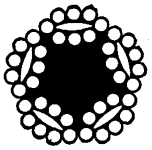
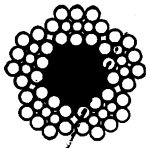
WIRE ROPE

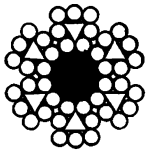
FLATTENED STRAND STEEL WIRE HAULAGE OR TRANSMISSION ROPE



Type C
Five Strands,
Nine Wires Each,
One Hemp Center



Type D
Five Strands,
Eleven Wires Each,
One Hemp Center



Type E
Six Strands,
Eight Wires Each,
One Hemp Center

Constructions Nos. 15, 16 and 17

Diameter in Inches	Weight Per 100 Feet: Types C and D	Weight Per 100 Feet: Type E	List Price Per Foot: Crucible Cast Steel	List Price Per Foot: Extra Strong Crucible Cast Steel	List Price Per Foot: Perfection Plow Steel
⅜	25	25	$0.07	$0.11	....
½	40	45	.10	.14	$0.16¼
⅝	65	75	.14	.18	.25
¾	95	100	.20½	.27	.35
⅞	125	140	.27½	.35	.44
1	165	180	.35	.45	.58
1⅛	205	230	.45	.54	.70
1¼	255	280	.54	.68	.88
1⅜	310	350	.64	.80	....
1½	365	400	.75	.93	....

For Wire Center for Type E, add 10%

APPROXIMATE STRENGTH IN TONS

Diameter in Inches	Crucible Cast Steel: Types C and D	Crucible Cast Steel: Type E	Extra Strong Crucible Cast Steel: Types C and D	Extra Strong Crucible Cast Steel: Type E	Perfection Plow Steel: Types C and D	Perfection Plow Steel: Type E
⅜	5	5	5½	5½	..	..
½	8	8½	9	10	12	12
⅝	13	14	15	16	18	19
¾	19	20	21	23	25	27
⅞	25	26	27	30	32	35
1	30	35	35	38	40	45
1⅛	37	41	45	46	50	60
1¼	46	50	55	60	70	75
1⅜	55	60	65	70	..	..
1½	65	70	75	80	..	..

Proper working load averages 20% of approximate strength

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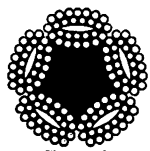
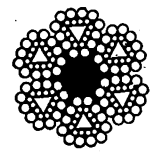
WIRE ROPE

FLATTENED STRAND HOISTING ROPE



Type A
Five Strands, 28 Wires Each, One Hemp Center



Type B
Six Strands, 25 Wires Each, One Hemp Center

Constructions Nos. 13 and 14

Diameter in Inches	List Price Per Foot, Types A and B — Swedes Iron	Crucible Steel	Extra Strong Crucible Steel	Perfection Plow Steel
3/8	$0.09½	....	....	....
½	.10½	$0.14½	$0.17½	$0.20¾
9/16	.13	.16½	.19½	.25
5/8	.15½	.18¼	.22½	.28
3/4	.21	.24	.30	.37½
7/8	.26	.30	.38	.49
1	.34	.39½	.48	.60
1⅛	.43	.50	.59	.71
1¼	.52	.59½	.70	.89
1⅜	.62½	.73	.90	1.12
1½	.74	.86	1.05	1.37
1⅝	.82	.96	1.30	1.56
1¾	1.04	1.21	1.55	2.08
2	1.20	1.44	1.77	2.25
2¼	1.52	1.82	2.20	2.85

For Wire Center in Type B, add 10%.

Diameter in Inches	Weight Per 100 Feet — Type A	Type B	Approximate Strength in Tons — Swedes Iron	Crucible Steel — Type A	Crucible Steel — Type B	Extra Strong Crucible — Type A	Extra Strong Crucible — Type B	Perfection Plow — Type A	Perfection Plow — Type B
3/8	25	25	2.3	..	..	..	..	..	..
½	40	45	4	8½	9½	9	10	12	13
9/16	50	60	5	10	11	11	12	15	16
5/8	63	75	6	13	14	14	16	20	21
3/4	90	100	9	18	20	20	23	27	30
7/8	120	140	12	23	25	25	30	35	40
1	160	180	15	30	35	35	40	45	50
1⅛	200	230	20	38	45	45	50	55	60
1¼	245	280	25	47	55	55	60	70	75
1⅜	300	345	30	55	65	65	70	85	95
1½	355	400	35	65	72	75	80	100	110
1⅝	415	475	40	75	80	85	91	115	125
1¾	485	560	45	85	95	100	110	135	145
2	630	725	55	105	120	125	135	165	185
2¼	800	920	75	135	145	160	175	210	230

Proper working load is 20% of approximate strength.

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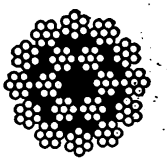
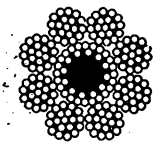
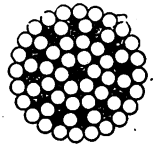
WIRE ROPE

NON-ROTATING HOISTING ROPE

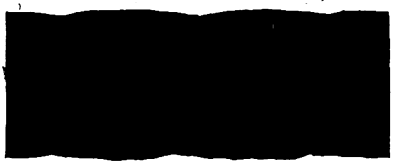




Type A
12 x 7 Right Lay over 6 x 7 Left Lay



Type C
12 x 3 Right Lay
over 6 x 3 Left Lay



Type B
8 x 19 Right Lay over 12 x 3 Left Lay

Price List Types A and B

Diameter in Inches	Iron Per Foot	Crucible Cast Steel Per Foot	Extra Strong Crucible Cast Steel Per Foot	Plow Steel Per Foot	Perfection Plow Steel Per Foot
3/8	$0.07	$0.09½	$0.11	$0.12½	$0.14½
7/16	.07½	.10	.11½	.13	.16
½	.08½	.11	.12½	.14	.17
9/16	.10	.12	.14	.16	.20
5/8	.12	.14	.16½	.19	.22½
3/4	.16	.19	.22	.26	.31
7/8	.20	.24	.29	.34	.39
1	.26	.31	.37	.43	.50
1⅛	.33	.38	.46	.54	.62
1¼	.40	.46	.56	.65	.75
1⅜	.49	.56	.68	.79	.90
1½	.57	.66	.80	.93	1.10
1⅝	.65	.77	.94	1.08	1.45
1¾	.80	.90	1.10	1.30	1.60

Type C is used in sizes up to ½ inch for arc light hoists and similar uses. Made only in Swedes iron and crucible steel galvanized. Prices on application.

Diameter in Inches	Weight Per 100 Feet in Pounds	Approximate Strength in Tons: Iron	Crucible Cast Steel	Extra Strong Crucible Cast Steel	Plow Steel	Perfection Plow Steel
3/8	25	2.10	4	4.5	5.50	6
7/16	31	2.65	5	6	7	8½
½	42	3.75	7	8	10	11
9/16	57	5	9	11	13	14½
5/8	70	6	11	13	16	18
3/4	100	9	17	20	24	27
7/8	145	12	22	27	32	35
1	175	15	28	33	36	39
1⅛	235	20	37	43	48	53
1¼	280	23.50	44	52	57	63
1⅜	360	28	52	63	68	75
1½	435	34	64	75	83	91
1⅝	490	40	75	88	97	106
1¾	550	46	86	101	111	122

Proper working load is 20% of approximate strength

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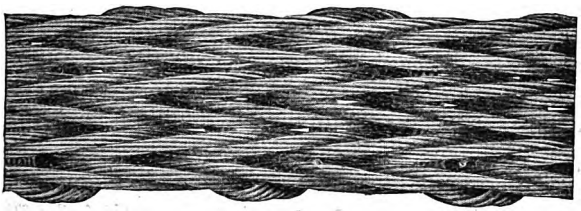
WIRE ROPE

FLAT WIRE ROPE

Crucible Steel, Plow Steel



These ropes are made by sewing together with soft iron wire, alternate right and left laid strands laid side by side.

They are used for simple hoisting and lowering where economy of space is necessary —winding themselves on drums but little wider than the rope. They are used principally on coal and ore docks, for canal gates, and the like.

Made in iron and all grades of crucible and plow steels.

Prices furnished on application.

			Crucible Steel		Plow Steel	
Thickness in Inches	Width in Inches	Approximate Weight Per 100 Feet in Pounds	Approximate Strength in Tons	Proper Working Load in Tons	Approximate Strength in Tons	Proper Working Load in Tons
¼	1½	65	13	2.6	15.5	3.10
¼	2	82	17	3.4	20	4.00
¼	2½	106	22	4.4	26.5	5.30
¼	3	123	26	5.2	31	6.20
5/16	1½	79	18	3.6	22	4.4
5/16	2	110	23	4.6	28	5.6
5/16	2½	135	30	6.0	35	7.0
5/16	3	160	36	7.2	43	8.6
5/16	3½	188	41	8.2	50	10.0
5/16	4	215	48	9.6	57	11.4
⅜	2	130	27	5.4	33	6.6
⅜	2½	170	36	7.2	43	8.6
⅜	3	189	41	8.2	49	9.8
⅜	3½	230	50	10.0	60	12.0
⅜	4	243	54	10.8	65	13.0
⅜	4½	285	63	12.6	76	15.2
⅜	5	310	68	13.6	81	16.2
⅜	5½	350	77	15.4	92	18.4
⅜	6	373	81	16.2	97	19.4
½	2½	220	45	9.0	54	10.8
½	3	250	52	10.4	63	12.6
½	3½	280	60	12.0	72	14.4

			Crucible Steel		Plow Steel	
Thickness in Inches	Width in Inches	Approximate Weight Per 100 Feet in Pounds	Approximate Strength in Tons	Proper Working Load in Tons	Approximate Strength in Tons	Proper Working Load in Tons
½	4	315	69	13.8	82	16.4
½	4½	385	83	16.6	99	19.8
½	5	420	90	18.0	108	21.6
½	5½	455	98	19.6	118	23.6
½	6	490	105	21.0	126	25.2
½	7	590	128	25.6	153	30.6
⅝	3½	350	68	13.6	79	15.8
⅝	4	400	79	15.8	92	18.4
⅝	4½	455	91	18.2	105	21.0
⅝	5	510	102	20.4	119	23.8
⅝	5½	565	114	22.8	132	26.4
⅝	6	615	125	25.0	145	29.0
⅝	7	730	148	29.6	171	34.2
⅝	8	840	170	34.0	197	39.4
¾	5	685	135	27.0	157	31.4
¾	6	750	151	30.2	175	35.0
¾	7	825	168	33.6	194	38.8
¾	8	1975	202	40.4	234	46.8
⅞	5	750	155	31.0	177	34.4
⅞	6	853	180	36.0	209	41.8
⅞	7	956	203	40.6	233	46.6
⅞	8	1060	225	45.0	258	51.6

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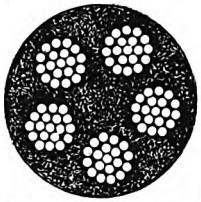
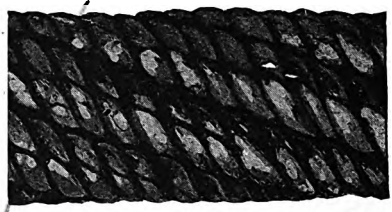
WIRE ROPE

MARLINE COVERED WIRE ROPE

Five Strands, 19 Wires Each, Hemp Center





Each strand laid up of tested wires, then served or wound with the best quality Tarred Russia Hemp Marline. The marline covering every strand protects all the wires from moisture in any form and grit of all kinds. It acts as a cushion between strands and prevents internal wear, and as a covering for the whole rope, preventing external wear on the wires. Atmospheric conditions do not affect it. By separating the strands Marline produces an exceedingly pliable rope without sacrificing strength.

When used for transmission, it soon mats down to a smooth perfectly round surface, increasing its frictional efficiency. It can be used to replace manila rope generally—is half the weight of manila rope of equal strength, and has less stretch. It does not swell from moisture and ice does not freeze to it.

Five Strands, 19 Wires Each, Hemp Center

		Crucible Cast Steel					Extra Strong Crucible Cast Steel			Plow Steel		
Diameter Wire	Diameter Over All	Approx. Weight Per 100 Feet	Approx. Strength in Tons	Replaces Manila Diam.	Replaces Wire Rope Diam.	List Per Foot	Approx. Strength in Tons	Replaces Manila Diam.	List Per Foot	Approx. Strength in Tons	Replaces Manila Diam.	List Per Foot
1/4	1/2	21	2.2	3/4	3/8	$0.14	2.43	13/16	$0.15	2.65	7/8	$0.16
5/16	9/16	26	3.1	1	7/16	.14½	3.5	1	.15½	3.8	1 1/8	.17
3/8	5/8	36	4.8	1 1/8	1/2	.15	5.3	1 1/4	.16	5.75	1 3/8	.18
7/16	11/16	40	6.5	1 3/8	9/16	.17	7.25	1 3/8	.18	8	1 1/2	.19½
1/2	3/4	49	8.4	1 9/16	5/8	.19	9.2	1 5/8	.20	10	1 3/4	.21
9/16	7/8	60	10	1 3/4	11/16	.21	11.2	1 7/8	.22	12.3	2	.23
5/8	1	80	12.5	2	3/4	.23	14	2 1/8	.25	15.5	2 1/4	.26
3/4	1 1/8	112	17.5	2 1/4	7/8	.26	20.2	2 1/2	.30	23	2 5/8	.34
7/8	1 1/4	129	23	2 5/8	1	.31	26	2 7/8	.36	29	3 1/8	.43
1	1 3/8	166	30	3	...	.40	34	3 3/8	.47	38	...	.53
1 1/8	1 1/2	207	38	...	...	.47	43	...	.53	47	...	.60
1 1/4	1 5/8	252	47	...	...	.59	53	...	.65	58	...	.72
1 3/8	1 3/4	306	56	...	...	.66	64	...	.78	72	...	.86
1 1/2	1 7/8	360	64	...	...	.78	73	...	.91	82	...	1.03
1 5/8	2	419	72	...	...	.86	83	...	1.01	94	...	1.17
1 3/4	2 1/8	488	85	...	...	1.05	99	...	1.25	112	...	1.43

HAWSER LAID CABLES

Crucible Cast Steel

5 x 5 x 7					5 x 5 x 19				
Diameter of Wire Strand	Diameter Over All	Approximate Weight 100 Feet	Approximate Strength in Tons	Price Per Foot	Diameter of Wire Strand	Diameter Over All	Approximate Weight 100 Feet	Approximate Strength in Tons	Price Per Foot
3/8	1 13/16	212	19	$0.55	3/8	1 13/16	212	20	$0.75
7/16	1 7/8	230	25	.64	7/16	1 7/8	230	26	.85
1/2	2	259	30	.72½	1/2	2	259	31	.95
9/16	2 5/16	320	40	.85	9/16	2 5/16	320	42	1.05
5/8	2 5/8	380	52	1.00	5/8	2 5/8	380	52	1.15

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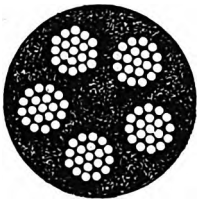
WIRE ROPE

MARLINE COVERED WIRE ROPE

Five Strands, 19 Wires Each, Hemp Center



Each strand laid up of tested wires, then served or wound with the best quality Tarred Russia Hemp Marline. The marline covering every strand protects all the wires from moisture in any form and grit of all kinds. It acts as a cushion between strands and prevents internal wear, and as a covering for the whole rope, preventing external wear on the wires. Atmospheric conditions do not affect it. By separating the strands Marline produces an exceedingly pliable rope without sacrificing strength.

When used for transmission, it soon mats down to a smooth perfectly round surface, increasing its frictional efficiency. It can be used to replace manila rope generally —is half the weight of manila rope of equal strength, and has less stretch. It does not swell from moisture and ice does not freeze to it.

Five Strands, 19 Wires Each, Hemp Center

			Crucible Cast Steel				Extra Strong Crucible Cast Steel			Plow Steel		
Diameter Wire	Diameter Over All	Approx. Weight Per 100 Feet	Approx. Strength in Tons	Replaces Manila Diam.	Replaces Wire Rope Diam.	List Per Foot	Approx. Strength in Tons	Replaces Manila Diam.	List Per Foot	Approx. Strength in Tons	Replaces Manila Diam.	List Per Foot
1/4	1/2	21	2.2	3/4	3/8	$0.22	2.43	13/16	$0.24	2.65	7/8	$0.26
3/16	9/16	26	3.1	1	7/16	.24½	3.5	1	.27	3.8	1 1/8	.29
3/8	5/8	36	4.8	1 1/8	1/2	.27	5.3	1 1/4	.30	5.75	1 3/8	.32
7/16	11/16	40	6.5	1 3/8	9/16	.30½	7.25	1 3/8	.33	8	1 1/2	.35
1/2	3/4	49	8.4	1 9/16	5/8	.34	9.2	1 5/8	.36	10	1 3/4	.38
9/16	7/8	60	10	1 3/4	11/16	.38	11.2	1 7/8	.42	12.3	2	.45
5/8	1	80	12.5	2	3/4	.42	14	2 1/8	.47	15.5	2 1/4	.51
3/4	1 1/8	112	17.5	2 1/4	7/8	.55	20.2	2 1/2	.61	23	2 5/8	.66
7/8	1 1/4	129	23	2 5/8	1	.66	26	2 7/8	.73	29	3 1/8	.79
1	1 3/8	166	30	3	...	.75	34	3 3/8	.83	38	...	.89
1 1/8	1 1/2	207	38	...	...	.85	43	...	.95	47	...	1.02
1 1/4	1 5/8	252	47	...	...	1.04	53	...	1.15	58	...	1.22
1 3/8	1 3/4	306	56	...	...	1.24	64	...	1.36	72	...	1.46
1 1/2	1 7/8	360	64	...	...	1.45	73	...	1.60	82	...	1.70
1 5/8	2	419	72	...	...	1.62	83	...	1.78	94	...	1.90
1 3/4	2 1/8	488	85	...	...	1.85	99	...	2.04	112	...	2.20

HAWSER LAID CABLES

Crucible Cast Steel

5 x 5 x 7				
Diameter of Wire Strand	Diameter Over All	Approximate Weight 100 Feet	Approximate Strength in Tons	Price Per Foot
3/8	1 13/16	212	19	$1.45
1/2	2	259	30	1.80

5 x 5 x 19				
Diameter of Wire Strand	Diameter Over All	Approximate Weight 100 Feet	Approximate Strength in Tons	Price Per Foot
3/8	1 13/16	212	20	
7/16	1 7/8	230	26	Price
1/2	2	259	31	on
9/16	2 5/16	320	42	Appli-
5/8	2 5/8	380	52	cation.

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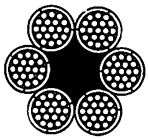
WIRE ROPE

STEEL COVERED HOISTING ROPE

Six Strands, 19 Wires to the Strand, One Hemp Core
Six Strands, 37 Wires to the Strand, One Hemp Core
Six Strands, 61 Wires to the Strand, One Hemp Core

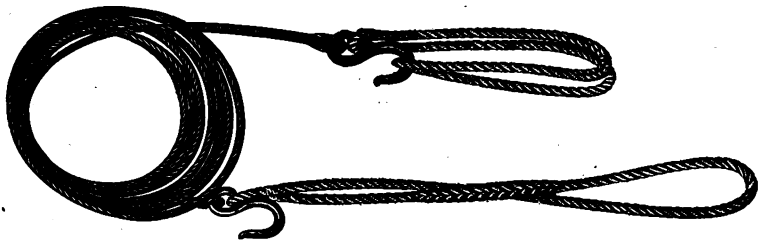


[redacted]

Steel covered ropes are regular round strand ropes with each strand served with soft flat steel strips. This increases the size of the finished rope but protects the steel wires in the strands from external and internal wear. It successfully meets extreme conditions of service and has given, in many cases, where conditions were suitable, from 50 to 100 per cent more service than unprotected ropes. The flat strips, when worn, crowd down between the strands and furnish more wearing surface as fast as the rope is worn down. Steel covered ropes are made with 19, 37 or 61 wires to each strand, in all grades of crucible and plow steels.

Lists furnished on application

THE U-W PULL-OUT LINE



Is made of ⅜ inch diameter extra flexible steel wire rope and is 25 feet long. Has a sling of manila rope spliced in each end for ease in attaching to axle. This also avoids scratching car and serves as a spring for the wire rope, taking the strain at starting and over rough places. Has an approximate strength of about five tons. Occupies little space in toolbox and should be carried in every car. Furnished fitted in neat brown canvas bag. Measures 12 inches in diameter by 3 inches thick. Weighs five pounds.

Price complete with bag, $5.00

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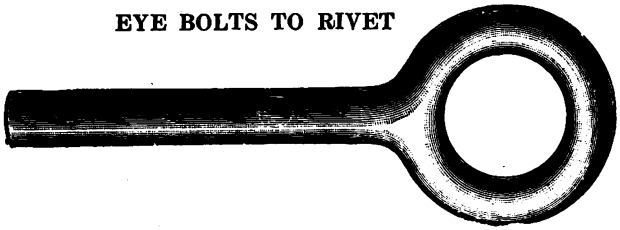
EYE BOLTS

EYE BOLTS TO RIVET



Wrought Iron. Drop Forged Regular Eye

Size iron, in.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1
Diam. eye, in.	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4	2
Length under eye, in.	4	4 1/4	4 1/2	4 3/4	5 1/4	5 3/8	5 1/2	6	7	8
Galvanized, per doz.	$1.20	1.40	1.60	2.00	2.40	2.80	3.20	5.80	8.50	10.00
Plain, per doz.	1.10	1.30	1.50	1.90	2.25	2.60	2.95	5.30	7.75	9.00

Small Eye

Size iron, in.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
Diam. eye, in.	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
Length under eye, in.	4	4 1/4	4 1/2	4 3/4	5 1/4	5 3/8	5 1/2	6	7	8	9	10
Galvanized, per doz.	$1.20	1.40	1.60	2.00	2.40	2.80	3.20	5.80	8.50	10.00	13.00	18.00
Plain, per doz.	1.10	1.30	1.50	1.90	2.25	2.60	2.95	5.30	7.75	9.00	12.00	16.50

SCREW EYE BOLTS

Wrought Iron. Drop Forged Regular Eye

Size iron, in.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1
Diam. eye, in.	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4	2
Length under eye, in.	2	2 1/4	2 1/2	2 3/4	3 1/4	3 3/4	4	4 1/2	5	6
Galvanized, per doz.	$1.20	1.40	1.60	2.00	2.40	2.80	3.20	5.80	8.50	10.00
Plain, per doz.	1.10	1.30	1.50	1.90	2.25	2.60	2.95	5.30	7.75	9.00

Small Eye

Size iron, in.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
Diam. eye, in.	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
Length under eye, in.	2	2 1/4	2 1/2	2 3/4	3 1/4	3 3/4	4	4 1/2	5	6	7	8
Galvanized, per doz.	$1.20	1.40	1.60	2.00	2.40	2.80	3.20	5.80	8.50	10.00	13.00	18.00
Plain, per doz.	1.10	1.30	1.50	1.90	2.25	2.60	2.95	5.30	7.75	9.00	12.00	17.00

NUT EYE BOLTS

Wrought Iron, Drop Forged, Regular Eye

Size iron, in.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1
Diam. eye, in.	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4	2
Length under eye, in.	2	2 1/4	2 1/2	2 3/4	3 1/4	3 3/4	4	4 1/2	5	6
Galvanized, per doz.	$1.40	1.60	1.80	2.30	2.60	3.10	3.60	6.20	9.00	12.00
Plain, per doz.	1.20	1.40	1.60	2.10	2.40	2.90	3.20	5.80	8.00	11.00

Small Eye

Size iron, in.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
Diam. eye, in.	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
Length under eye, in.	2	2 1/4	2 1/2	2 3/4	3 1/4	3 3/4	4	4 1/2	5	6	7	8
Galvanized, per doz.	$1.40	1.60	1.80	2.30	2.60	3.10	3.60	6.20	9.00	12.00	15.00	20.00
Plain, per doz.	1.20	1.40	1.60	2.10	2.40	2.90	3.20	5.80	8.00	11.00	13.50	18.00

Larger sizes and extra lengths furnished to order

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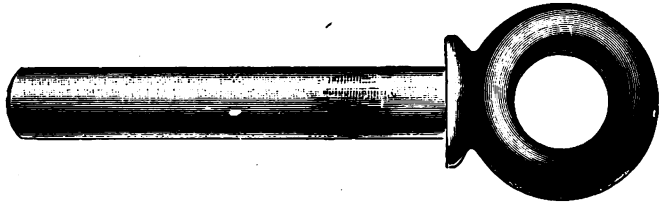
EYE BOLTS

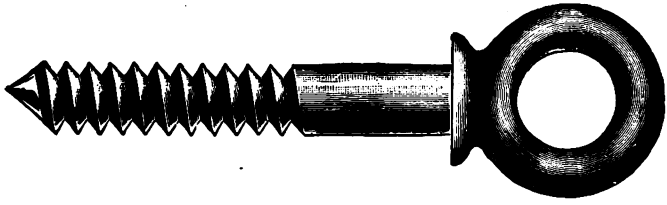
SHOULDER EYE BOLTS TO RIVET



Wrought Iron, Drop Forged

Size iron, in.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
Diam. eye, in.	3/8	7/16	1/2	5/8	5/8	7/8	7/8	1 1/16	1 1/4	1 7/16	1 3/4	2
Length under shoulder, in.	4	4 1/4	4 1/2	4 3/4	5 1/4	5 3/8	5 1/2	6	7	8	9	10
Galvanized, per doz.	$1.30	1.55	1.75	2.20	2.65	3.10	3.50	6.40	9.35	11.00	14.30	19.80
Plain, per doz.	1.20	1.45	1.65	2.10	2.50	2.85	3.25	5.85	8.50	9.90	13.20	18.70

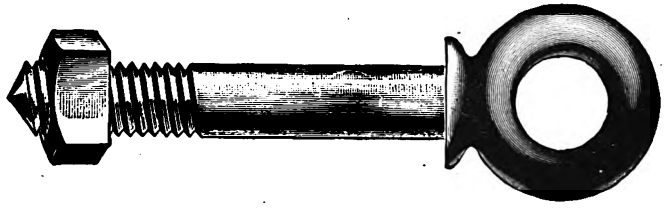
SHOULDER SCREW EYE BOLTS



Wrought Iron, Drop Forged

Size iron, in.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
Diam. under eye, in.	3/8	7/16	1/2	5/8	5/8	7/8	7/8	1 1/16	1 1/4	1 7/16	1 3/4	2
Length under shoulder, in.	2	2 1/4	2 1/2	2 3/4	3 1/4	3 3/4	4	4 1/2	5	6	7	8
Galvanized, per doz.	$1.30	1.55	1.75	2.20	2.65	3.10	3.50	6.40	9.35	11.00	14.30	19.80
Plain, per doz.	1.20	1.45	1.65	2.10	2.50	2.85	3.25	5.85	8.50	9.90	13.20	18.70

SHOULDER NUT EYE BOLTS



Wrought Iron, Drop Forged

Size iron, in.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
Diam. under eye, in.	3/8	7/16	1/2	5/8	5/8	7/8	7/8	1 1/16	1 1/4	1 7/16	1 3/4	2
Length under shoulder, in.	2	2 1/4	2 1/2	2 3/4	3 1/4	3 3/4	4	4 1/2	5	6	7	8
Galvanized, per doz.	$1.55	1.75	2.00	2.50	2.85	3.40	3.95	6.80	9.90	13.20	16.50	22.00
Plain, per doz.	1.30	1.55	1.75	2.30	2.65	3.20	3.50	6.40	8.80	12.10	14.85	19.80

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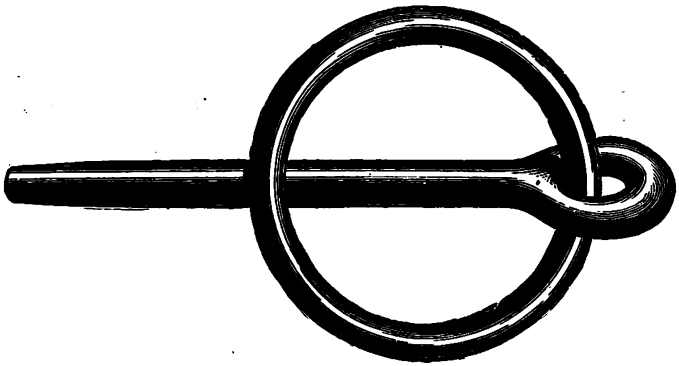
RING BOLTS

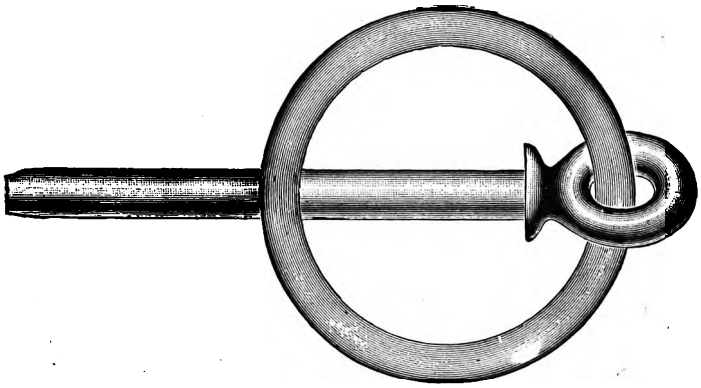
RING BOLTS TO RIVET



Wrought Iron, Drop Forged

Size iron, in.	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1
Diameter of ring, in.	1¾	2	2	2¼	2½	2½	2¾	3	3¼	3¾
Length under eye, in.	4	4¼	4½	4¾	5¼	5⅜	5½	6	7	8
Galvanized, per doz.	$1.60	2.40	2.80	3.20	3.60	4.50	5.50	8.50	13.00	19.00
Plain, per doz.	1.50	2.30	2.65	3.00	3.40	4.20	5.00	8.00	12.00	17.00
For each additional inch add	.20	.25	.25	.27	.27	.30	.35	.50	.60	.70

SHOULDER RING BOLTS TO RIVET



Wrought Iron, Drop Forged

Size iron, in.	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1
Diameter or ring, in.	1½	1¾	2	2	2¼	2½	2½	2¾	3	3¼
Length under shoulder, in.	4	4¼	4½	4¾	5¼	5⅜	5½	6	7	8
Galvanized, per doz.	$1.75	2.65	3.10	3.50	3.95	4.95	6.05	9.35	14.30	20.90
Plain, per doz.	1.65	2.55	2.90	3.30	3.75	4.60	5.50	8.80	13.20	18.70
For each additional inch add	.20	.25	.25	.27	.27	.30	.35	.50	.60	.70

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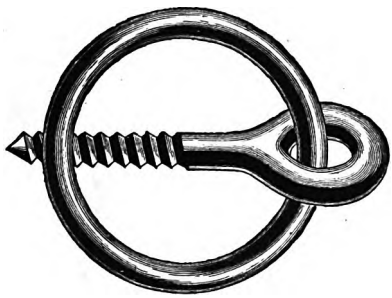
RING BOLTS

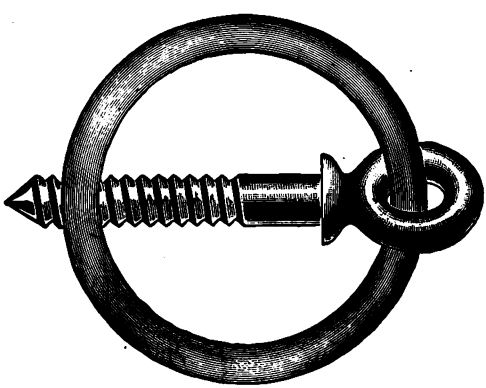
SCREW RING BOLTS



Wrought Iron, Drop Forged and Brass

Size iron, in.	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1	1⅛	1¼
Length under eye, in.	2	2¼	2½	2¾	3¼	3¾	4	4½	5	6	7	8
Inside diam. ring, in.	1¾	2	2	2¼	2½	2½	2¾	3	3¼	3¾	4¼	5
Galvanized, per doz.	$1.60	2.40	2.80	3.20	3.60	4.50	5.50	8.50	13.00	19.00	27.00	38.00
Plain, per doz.	1.50	2.30	2.65	3.00	3.40	4.20	5.00	8.00	12.00	17.00	24.00	34.00
For each additional inch	.20	.25	.25	.27	.27	.30	.35	.50	.60	.70	.90	1.15
Plain brass	2.50	3.00	4.00	6.00	9.00	12.00	15.00	....	....	....	....	....
Polished brass	3.25	4.25	6.00	8.40	12.00	16.00	20.00	....	....	....	....	....

SHOULDER SCREW RING BOLTS



Wrought Iron, Drop Forged

Size iron, in.	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1	1⅛	1¼
Length under shoulder, in.	2	2¼	2½	2¾	3¼	3¾	4	4½	5	6	7	8
Inside diam. of ring, in.	1½	1¾	2	2	2¼	2½	2½	2¾	3	3¼	3¾	4½
Galvanized	$1.75	2.65	3.10	3.50	3.95	4.95	6.05	9.35	14.30	20.90	29.70	41.80
Plain	1.65	2.55	2.90	3.30	3.75	4.60	5.50	8.80	13.20	18.70	26.40	37.40
For each additional inch	.20	.25	.25	.27	.27	.30	.35	.50	.60	.70	.90	1.15

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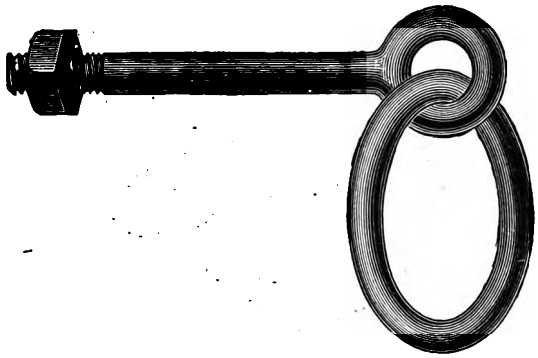
RING BOLTS

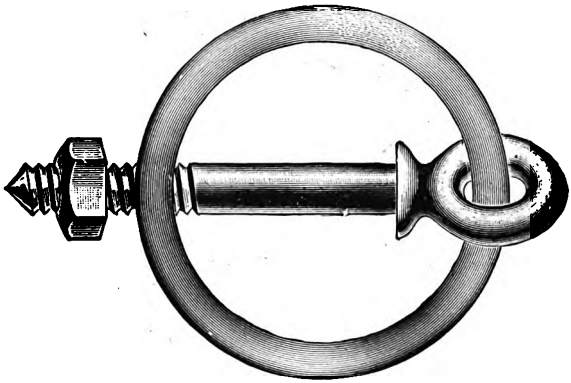
NUT RING BOLTS



Wrought Iron, Drop Forged

Size iron, in.	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1
Diameter of ring, in.	1¾	2	2	2¼	2½	2½	2¾	3	3¼	3¾
Length under eye, in.	2	2¼	2½	2¾	3¼	3¾	4	4½	5	6
Galvanized, per doz.	$2.00	2.60	3.00	3.50	3.80	4.70	6.00	9.50	14.00	20.00
Plain, per doz.	1.90	2.50	2.90	3.30	3.60	4.50	5.50	9.00	13.00	18.00
Extra lengths, in.	4	4¼	4½	4¾	5¼	5½	6	6½	8	9
Galvanized, per doz.	$2.20	2.90	3.30	3.90	4.20	5.20	6.60	10.50	15.50	22.00
Plain, per doz.	2.10	2.80	3.20	3.70	4.00	5.00	6.10	10.00	14.50	20.00
For each additional inch add	.20	.25	.25	.27	.27	.30	.35	.50	.60	.70

SHOULDER NUT RING BOLTS



Wrought Iron, Drop Forged

Size iron, in.	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1
Diameter of ring, in.	1½	1¾	2	2	2¼	2½	2½	2¾	3	3¼
Length under shoulder, in.	2	2¼	2½	2¾	3¼	3¾	4	4½	5	6
Galvanized, per doz.	$2.20	2.85	3.30	3.85	4.20	5.15	6.60	10.45	15.40	22.00
Plain, per doz.	2.10	2.75	3.20	3.65	3.95	4.95	6.05	9.90	14.30	19.80
Extra lengths, in.	4	4¼	4½	4¾	5¼	5½	6	6½	8	9
Galvanized, per doz.	$2.40	3.20	3.65	4.30	4.60	5.70	7.25	11.55	17.05	24.20
Plain, per doz.	2.30	3.10	3.50	4.05	4.40	5.50	6.70	11.00	15.95	22.00
For each additional inch add	.20	.25	.25	.27	.27	.30	.35	.50	.60	.70

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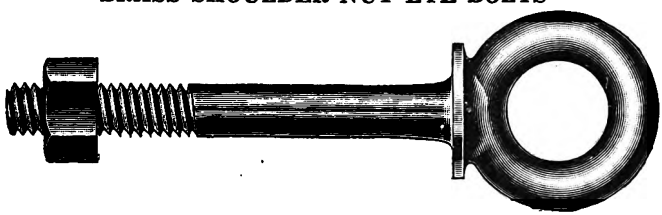
BOLTS, PLATES AND HOOKS

BRASS SHOULDER NUT EYE BOLTS



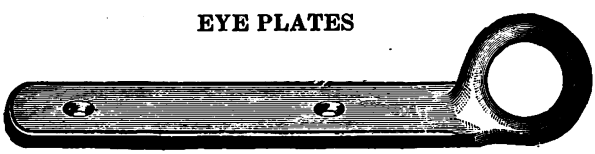
Diameter of shank, in.	¼	5/16	⅜	7/16	½
Diameter of eye, in.	½	⅝	¾	⅞	1
Length under shoulder, in.	2½	3	3½	4	4½
Plain brass, per doz.	$2.40	3.00	3.60	4.80	7.00
Polished brass, per doz.	3.60	4.20	4.80	6.00	9.00

CHAIN PLATES WITH EYE

Galvanized Wrought Iron and Brass

Length, in.	4	5	6	8	10	12	14	16	18	20
Width of plate in.	¾	⅞	1	1⅛	1¼	1¼	1½	1½	1⅝	1¾
Thickness of plate, in.	3/16	3/16	3/16	3/16	¼	¼	5/16	5/16	5/16	⅜
Galvanized, each	$0.30	.35	.38	.40	.50	.60	.70	.80	1.00	1.50
Bronze, each	.40	.50	.55	.60	.80	1.00	...	...	...	...

EYE PLATES



Galvanized Wrought Iron and Brass

Length, in.	3	4	5	6	8	10	12	14	16
Width plate, in.	¾	¾	⅞	1	1¼	1½	1⅝	1¾	1¾
Thickness plate, in.	3/16	3/16	¼	¼	¼	¼	5/16	5/16	⅜
Size of eye, in.	½	⅝	¾	⅞	1	1⅛	1¼	1⅜	1½
Galvanized, each	$0.25	.30	.35	.40	.50	.60	.80	.90	1.10
Bronze, each	.40	.50	.60	.65	.70	.80	...	...	...

CROTCH HOOKS

Galvanized and Brass

Length, in.	2½	2¾	3½	4	5
Width, in.	½	⅝	¾	⅞	1
Diameter hook, in.	⅜	7/16	½	⅝	¾
Galvanized, per pair	$0.20	.20	.25	.35	.45
Polished, per pair	.50	.50	.60	.80	1.00

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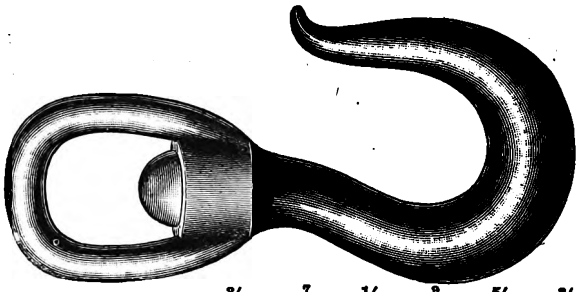
SWIVEL HOOKS AND SWIVELS

SWIVEL HOOK FOR BLOCKS AND CHAIN

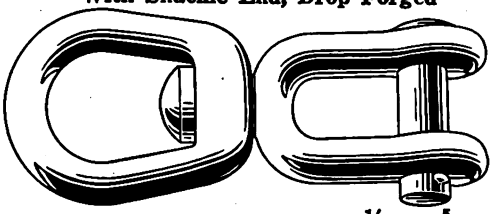
Drop Forged, Single Small Eye
Single



Size, in.	3/8	7/16	1/2	9/16	5/8	3/4	7/8	...	...
Galvanized, per doz	$3.60	3.96	4.20	4.44	4.92	8.40	9.60	...	...
Blacked, per doz	3.00	3.36	3.60	3.84	4.32	7.20	8.40	...	...
Size, in.	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2
Galvanized, each	$0.90	1.15	1.45	2.00	2.30	3.20	4.10	5.45	6.25
Blacked, each	.80	1.00	1.25	1.75	2.00	2.80	3.60	4.80	5.50

SWIVELS

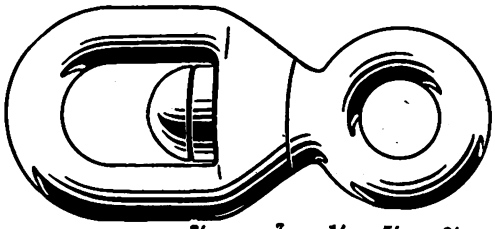
With Shackle End, Drop Forged



Diameter of iron, in.	1/4	5/16	3/8	1/2	5/8
Length, in.	3 1/4	4 1/8	4 1/2	5 5/8	7
Size of shackle, in.	3/4 x 3/4	1x1	1 1/4 x 1	1 1/2 x 1 1/4	1 3/4 x 1 1/2
Galvanized, each	$0.50	.55	.60	.77	1.20
Plain, each	.45	.50	.55	.70	1.10

Diameter of iron, in.	3/4	7/8	1	1 1/8	1 1/4
Length, in.	8	9	11	12	13 1/2
Size of shackle, in.	2x1 3/4	2 1/4 x 2	2 1/2 x 2 1/2	2 3/4 x 2 1/2	3x2 3/4
Galvanized, each	$1.50	2.25	3.00	4.00	6.00
Plain, each	1.35	2.00	2.70	3.50	5.00

With Eye, Drop Forged



Diameter of iron, in.	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4
Length, in.	5	5 1/2	6	7 1/2	8	9	10 1/2	11 1/2	12 1/2
Galvanized, each	$0.40	.45	.50	.80	1.00	1.50	2.00	3.25	5.00
Plain, each	.35	.40	.45	.70	.90	1.35	1.80	3.00	4.05

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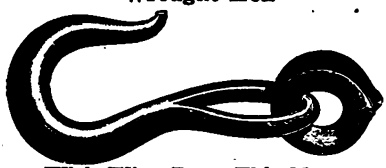
HOOKS AND THIMBLES

SINGLE HOOKS AND THIMBLES

Wrought Iron



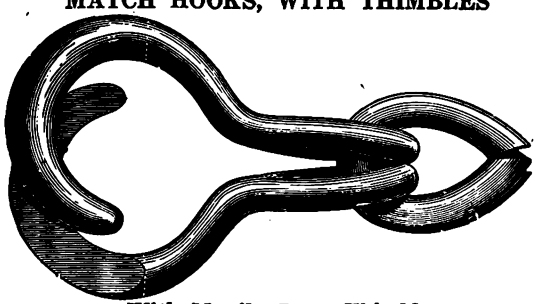
With Wire Rope Thimble

Size, in.	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1
Galvanized, each	$0.17	.18	.19	.21	.22	.24	.27	.35	.44	.50
Black, each	.16	.17	.18	.19	.20	.22	.25	.31	.38	.42
Size, in.	1⅛	1¼	1⅜	1½	1⅝	1¾	1⅞	2	2¼	2½
Galvanized, each	$0.70	1.00	1.20	1.50	1.95	2.86	3.00	4.00	5.50	7.00
Black, each	.58	.80	1.00	1.25	1.60	2.35	2.50	3.30	4.50	5.70

With Manila Rope Thimble

Size, in.	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1	1⅛
Galvanized, each	$0.12	.13	.14	.16	.17	.19	.21	.29	.37	.56	.67
Black, each	.11	.12	.13	.14	.15	.17	.19	.25	.33	.45	.53
Size, in.	1¼	1⅜	1½	1⅝	1¾	1⅞	2	2⅛	2¼	2⅝	2½
Galvanized, each	$0.82	1.16	1.55	1.88	2.50	3.00	3.65	4.30	4.71	6.28	6.78
Black, each	.66	.93	1.24	1.51	2.00	2.40	2.92	3.44	3.77	5.02	5.43

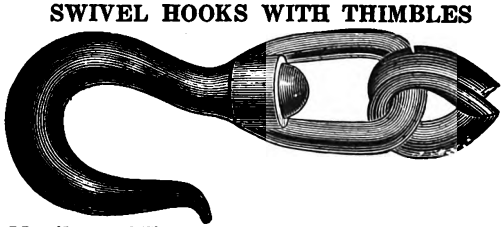
MATCH HOOKS, WITH THIMBLES



With Manila Rope Thimble

Size, in.	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1
Galvanized, each	$0.21	.21	.21	.22	.23	.24	.29	.39	.56	.68
Black, each	.20	.20	.20	.21	.21	.23	.27	.35	.52	.56
Size, in.	1⅛	1¼	1⅜	1½	1⅝	1¾	2	2¼	2½	
Galvanized, each	$0.84	1.15	1.55	2.05	2.36	3.20	4.62	5.97	7.20	
Black, each	.69	.94	1.27	1.67	1.94	2.60	3.78	4.88	5.90	

SWIVEL HOOKS WITH THIMBLES



Manila or Wire Rope Thimbles, Same Price

Size, in.	⅜	7/16	½	9/16	⅝	¾	⅞	1
Galvanized, per doz.	$3.84	4.20	4.56	4.80	5.40	9.00	10.20	Ea., .75
Black, per doz.	3.24	3.60	3.96	4.20	4.80	8.40	9.60	Ea., .85
Size, in.	1⅛	1¼	1⅜	1½	1⅝	1¾	1⅞	2
Galvanized, each	$1.20	1.55	2.15	2.45	3.40	4.30	5.65	6.55
Black, each	1.15	1.45	2.00	2.30	3.20	4.10	5.35	6.20

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WELDLESS HOIST HOOKS

With Eye

These hooks are submitted to a special refining process or heat treatment, after forging which increases their strength and toughness and reduces the liability of breakage.

To insure proper service at listed capacity every hook, after heat treatment, is proof tested to fifty per cent beyond its rated "Safe Working Load."

Each hook so tested is stamped O near its piece number which appears in raised letters on the forging and hence can be readily identified as proof tested.

Tobin bronze hooks from standard or special dies to order in quantities; prices on application.

A hook for safety chains on railroad cars with eye at right angle to hook, can be furnished to order in reasonable quantities.

Full size drawing will be sent on request. The size approximates dimensions of No. 27 hook.

When specified the No. 36 hook can be furnished from alloy steel, which will provide for a safe working load of 25 tons.

	Diameter of Eye		Extreme Dimensions			Capacity, Net Tons			
No.	Inside	Outside	Length	Width	Price	Safe Working Load	Average Load at Elastic Limit	Approx. Load Req. to Straighten Out	Weight Each Lbs.
22	¾	1½	4⅜	2⅞	$0.15	.5	.9	1.9	½
23	⅞	1¾	4⅞	3⅛	.18	.6	1.2	2.3	¾
24	1	2	5⅜	3½	.21	.7	1.5	3	1
25	1⅛	2¼	6⅛	3⅞	.27	1.2	2.5	5.7	1½
26	1¼	2½	6¾	4⅜	.36	1.7	3.5	7	2
27	1⅜	2¾	7⅝	4⅞	.50	2.1	4.2	8.5	3¼
28	1½	3	8½	5⅝	.70	2.5	5.4	10	4½
29	1⅝	3¼	9½	6⅜	.95	3	6.2	13	6
30	1¾	3½	10¼	6⅞	1.25	4	8	17	8¼
31	2	4	11½	7½	1.65	4.7	9	19	10¾
32	2⅜	4⅝	12⅞	8¼	2.35	5.5	11	26	15
33	2¾	5¼	14½	9¼	3.75	6.8	13	32	19¼
34	3⅛	6⅛	16½	10⅞	7.50	8	17	35	31½
35	3½	7	19	13	13.50	11	21	48	47
36	4	8½	22	14¾	30.00	20	40	80	....

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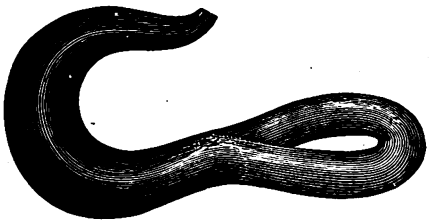
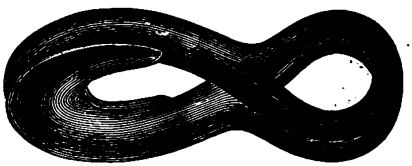
SMALL EYE HOOKS

WROUGHT IRON SIDE HOOKS

Single Hooks



Match Hooks



Single Hooks

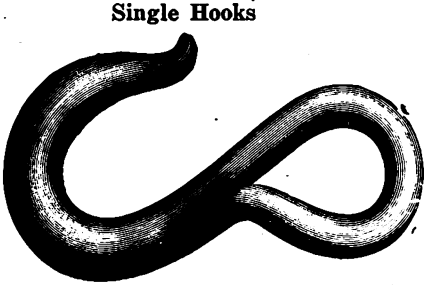
Size, in.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8
Length of hook, in.	2 1/16	2 9/16	2 5/8	2 5/8	3	3 1/2	3 3/4	4 5/8	5 1/2
Inside diam. eye, in.	7/16	5/8	5/8	5/8	3/4	11/16	11/16	1	1 1/4
Galvanized, each	$0.11	.12	.13	.14	.15	.17	.19	.25	.33
Black, each	.10	.11	.12	.13	.14	.16	.18	.23	.28
Size, in.	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2
Length of hook, in.	6 1/8	7	7 7/8	8 3/4	9	9 1/4	11	11 1/8	12 1/4
Inside diam. eye, in.	1 3/8	1 9/16	1 5/8	1 3/4	1 7/8	2 1/16	2 1/4	2 5/16	2 9/16
Galvanized, each	$0.38	.50	.74	.90	1.15	1.50	2.10	2.25	3.00
Black, each	.30	.40	.58	.75	.90	1.20	1.68	1.80	2.40

Match Hooks

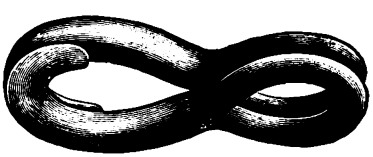
Size, in.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8
Length of hook, in.	2 1/4	2 1/2	2 5/8	3 1/8	3 1/2	4	4 1/4	4 7/8	5 3/4
Inside diam. eye, in.	5/8	3/4	11/16	7/8	15/16	1 1/8	1 1/16	1 1/8	1 5/16
Size, in.		1	1 1/8	.21	.22	.23	.27	.37	.50
Black, each	.19	.19	.19	.20	.21	.22	.26	.33	.41
Galvanized, each	$0.20	.20	.20	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	2
Length of hook, in.		6	6 1/2	7 5/16	8 1/16	8 3/4	9 1/8	9 7/8	11
Inside diam. eye, in.		1 3/8	1 1/2	1 11/16	1 13/16	1 7/8	1 7/8	2 3/16	2 1/2
Galvanized, each		$0.52	.61	.82	1.11	1.48	1.92	2.25	3.30
Black, each.		.43	.50	.67	.91	1.21	1.57	1.84	2.70

WROUGHT IRON FRONT HOOKS

Single Hooks



Match Hooks



Single Hooks

Size, in.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4
Galvanized, each	$0.11	.12	.13	.14	.15	.17	.19	.23	.25
Black, each	.10	.11	.12	.13	.14	.16	.18	.21	.23
Size, in.		7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 3/4	2
Galvanized, each		$0.33	.38	.51	.74	.91	1.12	1.90	2.70
Black, each.		.28	.31	.41	.59	.73	.89	1.52	2.16

Match Hooks

Size, in.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4
Galvanized, each	$0.20	.20	.20	.21	.22	.23	.27	.37
Black, each	.19	.19	.19	.20	.21	.22	.26	.33
Size, in.	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 3/4	2
Galvanized, each	$0.50	.52	.67	.82	1.11	1.40	2.25	3.30
Black, each	.41	.43	.50	.67	.91	1.21	1.84	2.70

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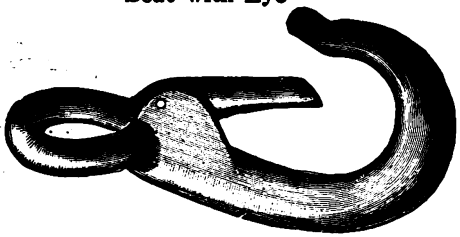
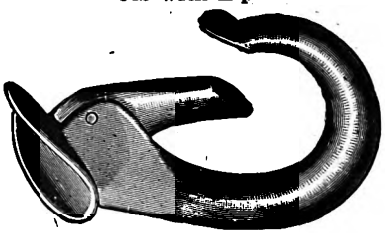
HOOKS

IMPROVED SNAP HOOKS

Boat with Eye



Jib with Lip

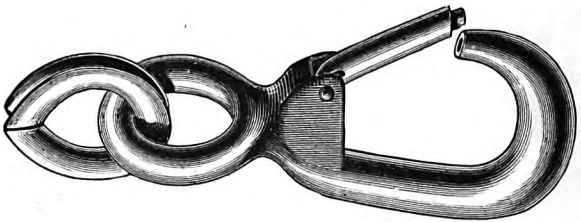


Galvanized Malleable Iron and Brass

Size	Inside Diameter of Eye Inches	Inside Diameter of Lip Inches	Galvanized Dozen	Plain Brass Dozen	Polished Brass Dozen
No. 0	7/16	1/4	$1.25	$2.00	$4.00
No. 1	5/8	5/16	1.50	2.50	5.00
No. 2	3/4	3/8	1.75	3.00	6.00
No. 3	7/8	1/2	2.50	4.00	7.00
No. 4	1	5/8	2.75	5.00	8.00
No. 5	1 1/8	5/8	3.50	6.50	10.00
No. 6	1 1/4	1	4.00	7.50	12.00

GAFF TOPSAIL HOOKS

Henshaw's Patent. Self-Mousing



Size, in.	7/16	1/2	5/8	3/4	7/8
Galvanized ..... each,	$0.40	.40	.80	.90	1.00

BABY SNAPS

Round Eye

Long Eye

Size of eye, in.	3/8	1/2
Tinned, per gross	$2.00	2.00
Galvanized, per gross	3.00	3.00
Plain brass, per gross	8.00	8.00

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HOOKS

SCREW HOOKS

Wrought Iron

Size iron, in.....	¼	5/16	⅜	7/16	½
Length, in.	4	4¼	4¾	5¼	5⅞
Galv., per doz....	$0.80	.90	1.00	1.40	1.80
Plain, per doz....	.70	.80	.90	1.20	1.50

Size iron, in.....	9/16	⅝	¾	⅞	1
Length, in.	5⅞	6¼	7¼	8⅛	8½
Galv., per doz....	$2.30	2.60	4.20	6.00	9.00
Plain, per doz....	2.00	2.20	3.70	5.00	8.00

BARREL HOOKS

Large

Small

Wrought Iron

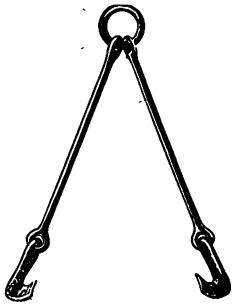
Length, in.	6½	10¼
Black, per pair.....	$0.90	1.35
Galvanized, per pair.....	1.00	1.50

HOGSHEAD HOOKS

Wrought Iron

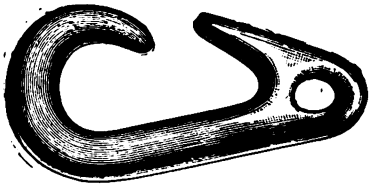
Width at bend, in.....	9½
Length, in.	9½
With chain, per pair.....	$3.75
Without chain, per pair.....	3.00

CAN HOOKS



Diam. iron, in.....	⅜	½	⅝	¾
Black, per pair.....	$0.70	1.15	1.35	3.50
Galvanized, per pair.	.75	1.25	1.50	3.75

CARGO HOOKS



Drop Forged

Nos.	20	21	22
Length, in.	8½	10½	12½
Size oval, in.....	1⅜x1	1⅝x1¼	2¼x1⅝
Each	$1.50	2.50	3.50

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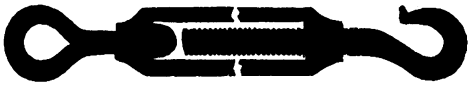
WROUGHT IRON TURNBUCKLES

Hook and Eye

Two Eyes

Two Hooks



Hook and Swivel Eye

Eye and Shackle

Two Shackles

BLACK OR GALVANIZED

Openings

Diam.	6 Inch	9 Inch	12 Inch	15 Inch	18 Inch	24 Inch
3/8	$0.40	....	....	....	....	....
7/16	.42	....	....	....	....	....
1/2	.45	$0.56	$0.68	$0.90	....	....
9/16	.48	.63	.75	1.00	....	....
5/8	.50	.63	.75	1.00	$1.25	$1.75
3/4	.63	.79	.95	1.26	1.58	2.20
7/8	.75	.94	1.13	1.50	1.88	2.62
1	.88	1.10	1.32	1.76	2.20	3.08
1 1/8	1.00	1.25	1.50	2.00	2.50	3.50
1 1/4	1.25	1.56	1.88	2.50	3.13	4.37
1 3/8	1.38	1.73	2.07	2.76	3.45	4.83
1 1/2	1.50	1.88	2.25	3.00	3.75	5.25

Prices on Jaws or Shackle and Special Stub Ends upon request

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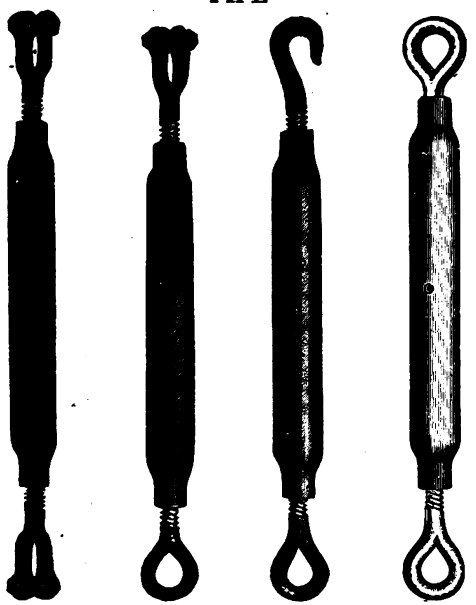
TURNBUCKLES

PIPE

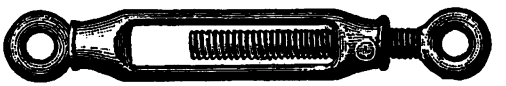


Two Shackles Eye and Shackle Hook and Eye Two Eyes

Galvanized Wrought Iron

Diameter of Ends Inches	Length of Pipe Inches	Price Each	Diameter of Ends Inches	Length of Pipe Inches	Price Each
1/4	5 1/2	$1.00	5/8	10 3/4	$2.40
5/16	5 3/4	1.10	3/4	12	3.50
3/8	6 1/2	1.30	7/8	13	4.25
7/16	7	1.50	1	15	5.50
1/2	8	1.80	1 1/8	16	7.00
9/16	9 1/4	2.10	1 1/4	16	8.25

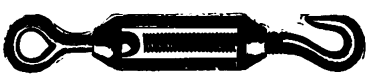
CAST BRASS



Swivel Eye

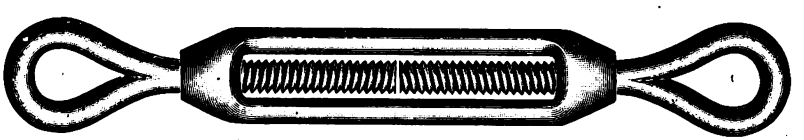
Size No.....	1	2	3	4	5
Lgth. closed; in....	2 1/4	3	3 1/2	4 1/4	5
Screw opens, in...	3/4	1 1/8	1 1/2	1 3/4	2 1/4
Each	$0.25	.30	.40	.45	.50

MALLEABLE IRON
With Wrought Hook



Diam. Thread End, in.	Length in Clear Between Heads, in.	Galvanized Each	Plain Each
3/16	3	$0.55	$0.48
1/4	3 3/4	.60	.50
5/16	4 1/4	.65	.55
3/8	4 3/4	.85	.70
7/16	5 1/2	1.00	.90
1/2	6	1.25	1.00
9/16	8	1.75	1.50
5/8	8	1.90	1.75
3/4	9	3.00	2.50
7/8	10	4.00	3.50

SNUG TURNBUCKLE



Drop Forged Steel

Diam. of Ends Inch	Length in the Clear Between Heads Inches	Total Length Closed Inches	Galvanized Each
3/16	1 3/4	4 1/4	$0.75

Also furnished with hook and eye and hook and hook.

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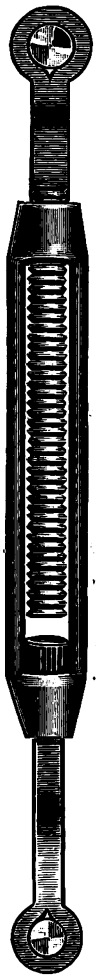
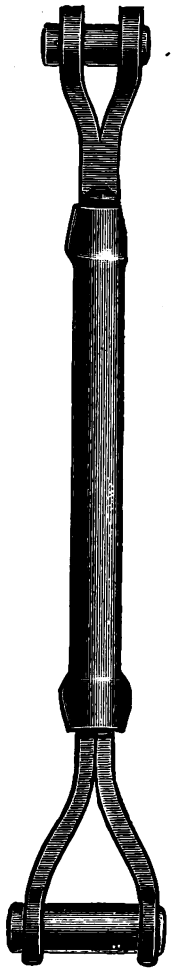
RIGGING TURNBUCKLES

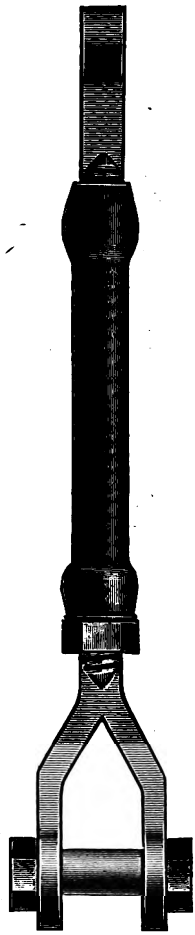


Front



Side

Front



Side

These types of turnbuckles are made especially for ships rigging and on account of the material used and method of construction insure greatest amount of service.

We are prepared to furnish these types in all sizes according to blue prints or specifications, either from stock or to special order, on short notice.

Furnished galvanized unless otherwise specified.

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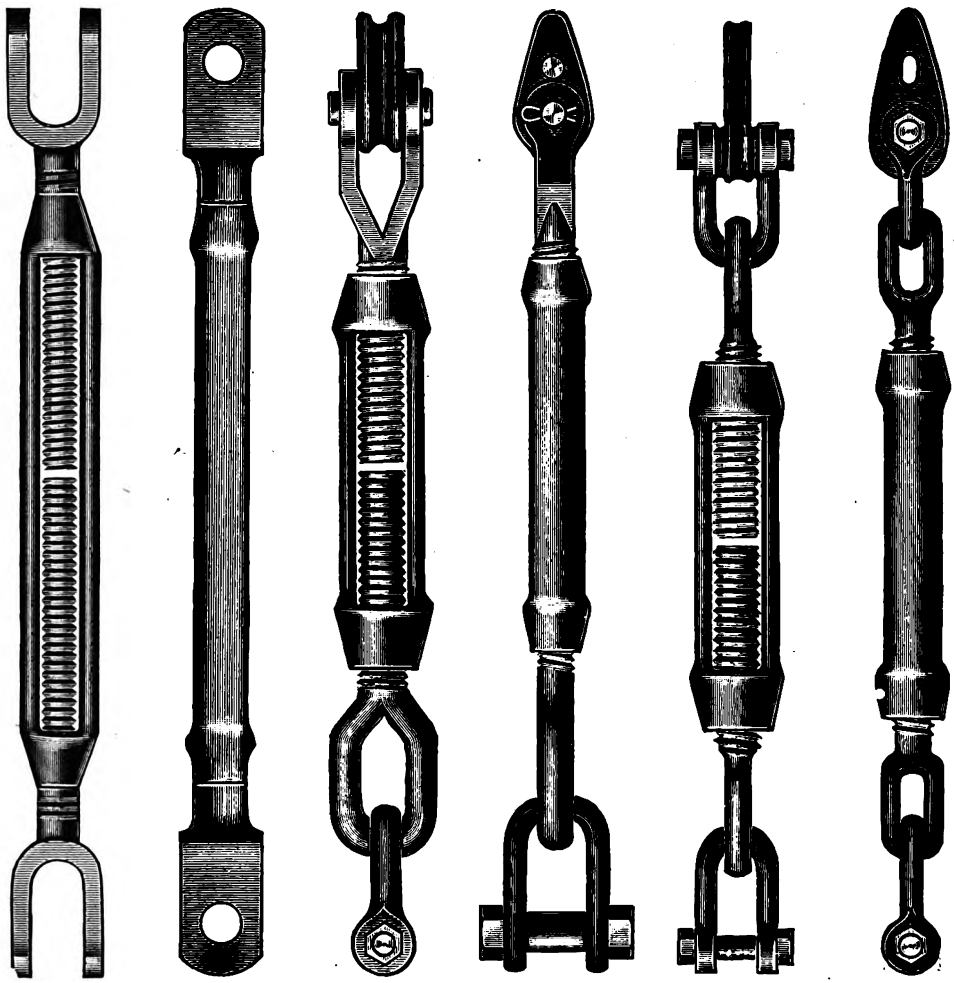
RIGGING TURNBUCKLES



Front Side Front Side Front Side

These types of turnbuckles are made especially for ships rigging and on account of the material used and method of construction insure greatest amount of service.

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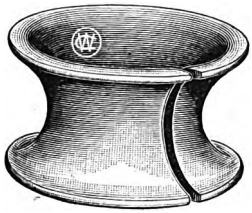
THIMBLES

MANILA ROPE THIMBLES

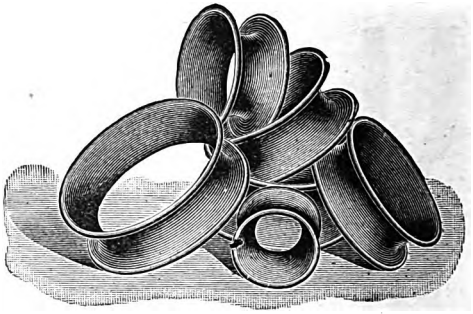
Open Steel



Diam. Inches	Width of of Score Inches	Weight per 100 Lbs.	Galv. per Doz.	Blacked per Doz.	Plain per Doz.
¾	⅜	2	$0.28	$0.26	$0.24
⅞	7/16	2	.28	.26	.24
1	½	3	.28	.26	.24
1⅛	9/16	5	.30	.28	.26
1¼	⅝	6	.32	.30	.28
1⅜	11/16	8	.34	.32	.30
1½	¾	9	.36	.34	.32
1¾	⅞	16	.45	.40	.35
2	1	23	.60	.55	.50
2¼	1 3/16	31	.90	.80	.70
2½	1¼	43	1.10	.95	.80
2¾	1 7/16	53	1.40	1.20	1.00
3	1½	63	1.60	1.40	1.25
			Pound	Pound	Pound
3¼	1⅝	90	.20	.18	.16
3½	1¾	111	.20	.18	.16
3¾	1⅞	148	.20	.18	.16
4	2	158	.20	.18	.16
4½	2 5/16	234	.20	.18	.16
5	2½	366	.20	.18	.16
5½	2¾	421	.20	.18	.16
6	3	601	.20	.18	.16
7	3½	1006	.20	.18	.16
8	4	1050	.20	.18	.16

MANILA ROPE THIMBLES

Closed, Malleable Iron

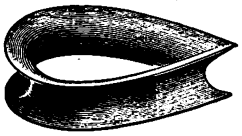


Light

Outside Diam. Inches	Per Dozen	Outside Diam. Inches	Per Dozen
⅝	$0.25	1¾	$0.55
¾	.25	2	.60
⅞	.30	2¼	.70
1	.35	2½	.80
1⅛	.38	2¾	.95
1¼	.40	3	1.10
1⅜	.42	3¼	1.35
1½	.45	3½	1.70
1⅝	.50	4	2.25

Heavy

Outside Diam. Inches	Per Dozen	Outside Diam. Inches	Per Dozen
1¾	$0.65	3½	$2.15
2	.70	3¾	2.80
2¼	.85	4	3.25
2½	1.25	4¼	3.60
2¾	1.60	4½	4.30
3	1.70	4¾	5.40
3¼	1.90	5	6.30



YACHT WIRE ROPE THIMBLES

Steel, for Rigging Where Small Eye Is Required

Wd. of Score Inch	Circumference of Rope Inch	Extreme Length Inches	Galvanized Each
⅛	½	1 1/16	$0.04
3/16	⅝	1⅛	.05
¼	¾	1¼	.05
5/16	⅞	1⅝	.06
⅜	1	1¾	.07

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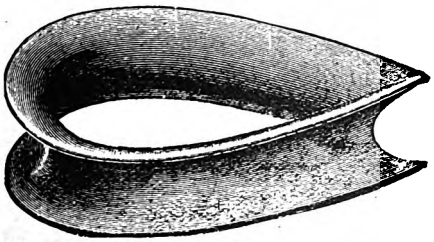
THIMBLES

WIRE ROPE THIMBLES
Closed

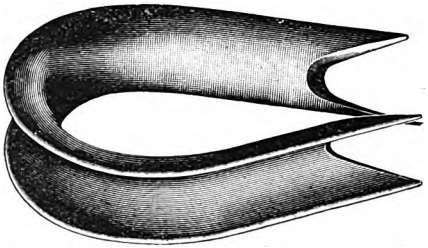


Width of Score Inches	Circumference of Rope Inches	Extreme Length Inches	Galvanized Each	Plain Brass Each
⅛	½	1½	$0.04	$0.12
3/16	⅝	1¾	.05	.12
¼	¾	2	.05	.13
5/16	⅞	2⅛	.06	.14
⅜	1	2½	.07	.15
7/16	1¼	2⅝	.08	.16
½	1½	3	.09	.17
9/16	1¾	3	.10	.18
⅝	2	3⅝	.11	.20
¾	2½	3⅞	.13	.25
⅞	2¾	4½	.14	..
1	3	4⅞	.18	..
1 1/16	3¼	5	.28	..
1⅛	3½	5⅛	.28	..
1¼	3¾	5⅝	.33	..
1 5/16	4	5¾	.40	..
1⅜	4¼	6	.42	..
1½	4½	6⅞	.50	..
1⅝	5	7¼	.65	..
1¾	5½	7¼	.75	..
1⅞	5¾	7⅜	.95	..
2	6	8¼	1.10	..
2¼	6½	9⅞	1.58	..
2½	7½	9⅞	2.08	..

MALLEABLE CAST THIMBLES
For Wire Towing Hawsers

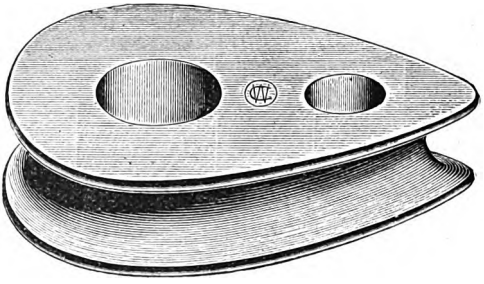
Diameter of Rope Inches	Length of Opening Inches	Width of Opening Inches	List
1¼	9	5½	$5.50
1½	10	6	6.00
1⅝	10	6½	7.50
1¾	10	6½	7.50
2	12	7	9.75

WIRE ROPE THIMBLES
Open



Width of Score Inch	Circumference of Rope Inches	Extreme Length Inches	Galvanized Each
⅛	½	1½	$0.04
3/16	⅝	1¾	.05
¼	¾	2	.05
5/16	⅞	2⅛	.06
⅜	1	2½	.07
7/16	1¼	2⅝	.08
½	1½	3	.09
9/16	1¾	3	.10
⅝	2	3⅝	.11
¾	2½	3⅞	.13
⅞	2¾	4½	.14
1	3	4⅞	.18

SOLID IRON FOR WIRE SHROUDS



Width of score, in.	½	⅝	¾	⅞	1
Size of bolt, in...	½	⅝	¾	⅞	1
Galvanized, each..	$0.25	.28	.30	.35	.40
Width of score, in.	1⅛	1¼	1⅜	1½	1⅝
Size of bolt, in...	1¼	1¼	1⅜	1½	1⅝
Galvanized, each..	$0.50	.65	.95	1.00	1.25

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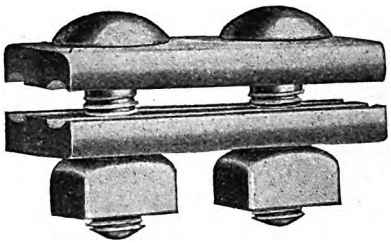
WIRE ROPE CLAMPS

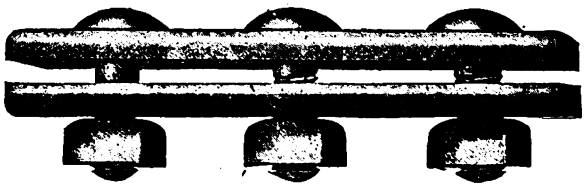
GALVANIZED TWO-BOLT TELEPHONE CLAMP



Assembled with ½ in. carbon steel bolts.....each, $0.15

Weight per hundred, 110 pounds

GALVANIZED THREE-BOLT TELEPHONE CLAMP



This is known as the standard A. T. & Co. hot galvanized rolled steel strand clamp or guy clamp; made from open hearth bar steel. Will hold any size of strand from ¼ in. to ½ in. in diameter.

Weight per hundred, 210 lbs.....each, $0.20

TILLER ROPE CLIPS

For Rope Diameter Inch	Light Pattern Plain Brass Each	Heavy Pattern Galvanized Each	Heavy Pattern Plain Brass Each
⅛	$0.25	$0.25	$0.30
3/16	.30	.30	.35
¼	.35	.35	.40
5/16	.40	.40	.50
⅜	.50	.45	.60

Light pattern clips have 2 screws; heavy pattern larger than ⅛ in. have 3 screws.

WIRE ROPE SHOES TO RIVET

Single Double

Made for all sizes of wire rope, 1 in. and larger.

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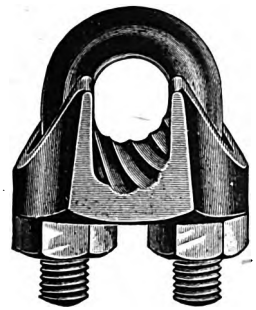
WIRE ROPE CLAMPS

U-W PATTERN

Black and Galvanized



Size Clip Corresp'g to Rope Diameter Inches	Approximate Weight 100 Pieces	List Price Each
¼	15 lbs	$0.25
5/16	17½ lbs	.25
⅜	25 lbs	.25
7/16	30 lbs	.30
½	40 lbs	.30
9/16	59 lbs	.35
⅝	63 lbs	.35
¾	95 lbs	.40
⅞	140 lbs	.45
1	175 lbs	.50
1⅛	282 lbs	.60
1¼	342 lbs	.65
1⅜	501 lbs	.70
1½	582 lbs	.75
1⅝		2.50
1¾		3.50
2		4.00
2¼		5.00
2½		6.00

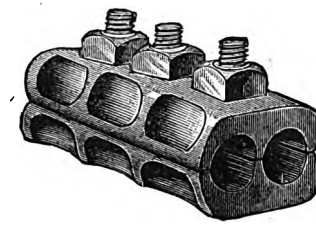
The U-W is a simple clamp, just a plate with spiral corrugations to fit between the strands of the rope and prevent its slipping, and a U Bolt to pull the two ropes tight against each other and against the plate.

The bolt is made of best wrought steel, the plate of iron so malleable that it will bend double, and both are made heavy enough to firmly clamp the rope without danger of breaking.

U-W Clamps will stand as much strain as the wire rope to which they are attached.

HIGGANUM PATTERN

Blacked



Clamps 3¾ inches to 5 inches have 4 bolts; 5½ inches and larger, have 5 bolts.

Diam. of Rope Inches	Circumference of Rope Inches	Each
⅜	1	$0.25
7/16	1¼	.28
½	1½	.30
9/16	1¾	.33
⅝	2	.35
¾	2¼	.40
13/16	2½	.45
⅞	2¾	.50
1	3	.60
1 1/16	3¼	.65
1⅛	3½	.75
1 3/16	3¾	.90
1¼	4	1.10
1 7/16	4½	1.50
1⅝	5	3.00
1¾	5½	4.00
2	6	5.00
2¼	6¾	7.50
2½	7½	8.00

Order by diameter

If galvanized, add 3 cents extra per pound, net.

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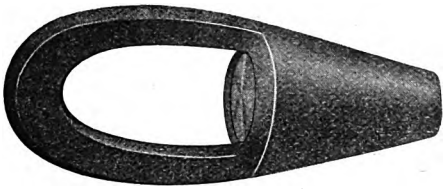
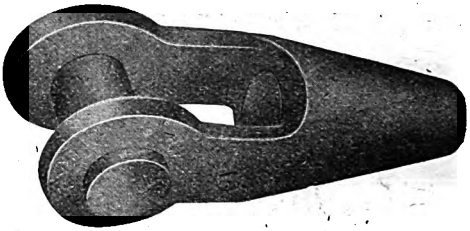
WIRE ROPE SOCKETS

Drop Forged Weldless

Closed



Open



Closed Sockets

For Size Diameter Rope Inches	Sockets only Each	Sockets Attached	Extreme Length Inches	Length of Bowl Inches	Largest Diameter of Bowl Outside Inches
1/4	$0.60	$1.50	5 1/8	2 1/2	1 11/16
5/16	.65	1.55	5 1/8	2 1/2	1 11/16
3/8	.75	1.75	5 1/8	2 1/2	1 11/16
7/16	.80	1.95	5 1/8	2 1/2	1 11/16
1/2	1.00	2.10	6	2 5/8	1 7/8
9/16	1.10	2.35	6	2 5/8	1 7/8
5/8	1.35	2.65	6 1/2	3	2 1/4
3/4	1.80	3.30	8	3 1/2	2 5/8
7/8	2.50	4.50	9	4	3
1	3.50	5.75	10 3/8	4 1/2	3 1/2
1 1/8	4.00	6.85	10 3/8	4 1/2	3 1/2
1 1/4	6.00	9.50	11 1/4	5	3 7/8
1 3/8	6.50	10.75	11 1/4	5	3 7/8
1 1/2	9.00	14.00	14	6	4 1/2
1 5/8	10.00	16.00	14	6	4 1/2
1 3/4	16.00	24.00	....	....	....
1 7/8	17.50	28.75	....	....	....
2	24.00	33.50	....	....	....
2 1/4	26.00	37.00	....	....	....

Open Sockets

For Size Diameter Rope Inches	Sockets only Each	Sockets Attached	Extreme Length Inches	Length of Bowl Inches	Diameter of Pin Inches
1/4	$0.85	$1.75	4 3/4	2 1/2	1/2
5/16	.90	1.80	4 3/4	2 1/2	1/2
3/8	1.20	2.20	4 3/4	2 1/2	5/8
7/16	1.25	2.40	4 3/4	2 1/2	5/8
1/2	1.60	2.75	5 1/2	2 5/8	7/8
9/16	1.70	2.95	5 1/2	2 5/8	7/8
5/8	2.10	3.40	6 1/2	3	1
3/4	2.70	4.20	7 1/4	3 1/2	1 1/8
7/8	3.40	5.40	8 1/2	4	1 1/4
1	4.50	6.75	10	4 1/2	1 3/8
1 1/8	5.00	7.85	10	4 1/2	1 1/2
1 1/4	8.00	11.50	11 1/4	5	1 5/8
1 3/8	8.50	12.75	11 1/4	5	1 3/4
1 1/2	11.50	16.50	13 1/2	6	1 7/8
1 5/8	12.50	18.50	13 1/2	6	2
1 3/4	22.00	30.00	15	7	2
1 7/8	24.00	36.75	15	7	2
2	34.00	43.50	16	8	2 3/8
2 1/4	37.00	48.00	16	8	2 3/8

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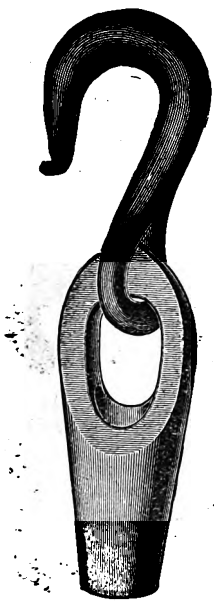
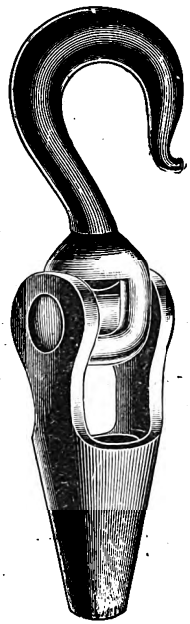
WIRE ROPE SOCKETS

DROP FORGED

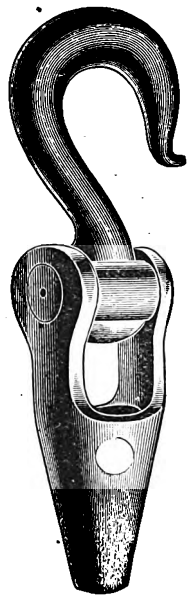
With Loose Hook



With Loose Swivel Hook



With Double Swivel Hook



With Stiff Swivel Hook

For Size Diameter Rope	Size of Hook	With Loose Hook	With Loose Swivel Hook	With Double Swivel Hook	With Stiff Swivel Hook
¼	⅝	$1.00	$1.40	$3.80	$2.30
5/16	¾	1.00	1.80	3.90	2.30
⅜	⅞	1.50	2.20	4.00	2.70
7/16	⅞	1.60	2.25	4.50	2.85
½	1	2.00	2.70	5.50	3.55
9/16	1	2.10	2.80	5.70	3.75
⅝	1⅛	2.50	3.40	6.00	4.60
¾	1⅜	3.60	5.15	8.50	5.25
⅞	1⅝	4.90	7.25	10.10	7.00
1	1¾	6.50	9.50	11.80	8.35
1⅛	1⅞	7.40	11.70	14.70	12.00
1¼	2	11.20	15.70	20.70	17.00
1⅜	2¼	15.50	20.50	23.00	21.00
1½	2½	17.00	34.25	31.00	27.00

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WIRE SWITCH ROPE FORGINGS

Hook and thimble in one end; thimble and link in the other end.

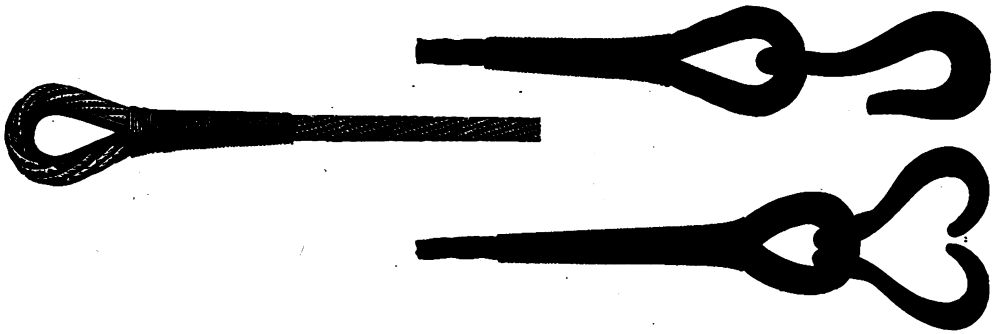
Diam., in.	½, ⅝, ¾	⅞	1	1⅛	1¼	1⅜	1½	1⅝	1¾	1⅞	2
Fittings only, per set	$6.00	8.75	10.00	13.00	16.50	21.57	25.00	30.00	35.00	45.00	55.00

Hook, thimble and link in one end; thimble and two links in the other end.

Diam., in.	½, ⅝, ¾	⅞	1	1⅛	1¼	1⅜	1½	1⅝	1¾	1⅞	2
Fittings only, per set	$7.50	10.50	12.00	15.00	20.00	25.00	29.00	32.50	40.00	52.00	65.00

Above prices cover fittings and splicing only. To this list should be added the list price of rope desired. List so obtained is subject to galvanized rope discounts.

HOOKS AND THIMBLES, SPLICED AND SERVED



Diameter of Rope Inches	Galvanized Thimble For Iron Rope	Galvanized Thimble For Steel Rope	Hook and Thimle For Iron Wire Rope	Hook and Thimle For Steel Wire Rope	Match Hook and Thimble For Iron Wire Rope	Match Hook and Thimble For Steel Wire Rope
¼	$1.00	$1.10	$1.50	$1.75	$1.50	$1.75
5/16	1.00	1.10	1.50	1.75	1.50	1.75
⅜	1.05	1.15	1.60	1.85	1.60	1.85
7/16	1.10	1.20	1.70	1.95	1.70	1.95
½	1.15	1.25	1.80	2.05	1.80	2.05
9/16	1.20	1.30	1.95	2.40	1.95	2.40
⅝	1.45	1.55	2.20	2.85	2.20	2.85
¾	1.85	2.00	2.85	3.75	2.85	3.75
⅞	2.40	2.55	3.70	5.35	3.70	5.35
1	2.85	3.00	4.65	6.70	4.65	6.70
1⅛	3.65	3.90	5.90	8.15	5.90	8.15
1¼	4.35	4.70	6.90	9.20	6.90	9.20
1⅜	5.25	5.75	8.65	11.15	8.65	11.15
1½	6.00	6.50	11.00	13.50	11.00	13.50

SPLICING ROPE ENDLESS

In addition to charge for rope used in making splice.

Diameter of rope, in.	¼ to 5/16	⅜ to 7/16	½	⅝	¾	⅞	1	1⅛	1¼	1½
For splicing only	$2.50	3.00	3.50	4.00	4.25	4.75	5.00	5.50	6.00	8.00

The above prices apply to rope spliced at our shop. For work done elsewhere special arrangements will be made.

NOTE—Splicing endless requires from 12 to 50 feet of extra rope, for making the splice, according to size.

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TACKLE BLOCKS

The Cleveland

We claim for our Cleveland blocks that they are unexcelled by anything on the market. Straps, pins and rivets of steel, and shells of malleable iron, which has proven superior to steel for the purpose. Sheaves with plain, self-lubricating, or patent roller bushings. Straps extending below the pins, thus not depending on the shell alone for strength.

New Oval

For those who have been using wooden blocks, on account of lightness. The shells are pressed from sheet steel, edges of which are well turned to prevent chafing of the rope. Hooks and straps are of best open hearth steel.

Special Blocks

Our special blocks, as listed, have been improved from time to time, until we consider them perfect for the various uses for which they are intended. We are prepared to manufacture other special designs on request, and can guarantee prompt and satisfactory work.

We are also prepared and will be pleased at any time to make up block specifications from rigging plans, quoting a net figure on same.

Sheaves

Plain, roller bushed, and self lubricating sheaves are interchangeable, and may be used either in the Cleveland or Oval blocks, thus allowing dealers to carry a varied stock at small expense.

Wooden and Galvanized Blocks

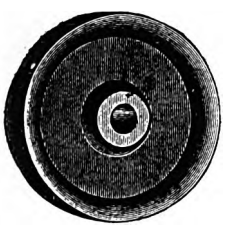
We carry a large stock of both and can fill orders of any size promptly.

Any of our steel blocks can be furnished galvanized at slight additional cost, within a few days' time.

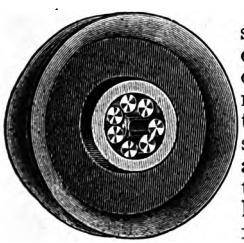
Yacht rigging blocks with lignum vitae sheaves or shells can be furnished on short notice.

BUSHINGS

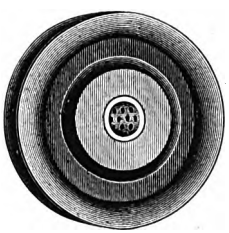
The bushing is the kind of bearing a sheave has upon the pin. The three styles shown here are those most commonly used.

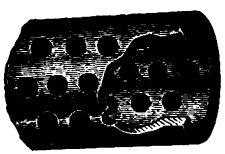


In a *plain bushed* sheave the bearing is simply a hole drilled in cast iron. These, of course, are the cheapest, and are most commonly used, being furnished unless other styles are specified.



Roller bushed sheaves bear on rollers that in turn bear on the pin. These run with less friction than the common sheave, and on this account are generally the favorite where hand power is used for hoisting.





Self-lubricating sheaves are made with a perforated bronze bushing, as shown, the holes being filled with a special lubricant. As the bearing wears, the lubricant is distributed, thus the name "self-lubricating. On account of their construction, these sheaves are the most durable, and are generally used in wire rope blocks.

Use no oil on self lubricating sheaves.

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TACKLE BLOCKS

CLEVELAND MALLEABLE TACKLE BLOCKS

For Manila Rope

Single

Triple

Double

Dimensions Length of Shell in Inches	Dimensions Diam. of Rope in Inches		Plain Bushed Price	Plain Bushed Trade No.	Roller Bushed Price	Roller Bushed Trade No.	Self Lubricating Phosphor Bronze Bushed Price	Self Lubricating Phosphor Bronze Bushed Trade No.
4	½	Single	$0.90	1	$1.30	2	$1.65	301
		Double	1.75	3	2.50	4	3.25	303
		Triple	2.50	5	3.60	6	4.75	305
5	⅝	Single	1.00	7	1.50	8	1.80	307
		Double	1.90	9	2.90	10	3.50	309
		Triple	2.75	11	4.25	12	5.15	311
6	¾	Single	1.25	13	1.75	14	2.10	313
		Double	2.25	15	3.25	16	4.00	315
		Triple	3.25	17	4.75	18	5.80	317
7	⅞	Single	1.50	19	2.10	20	2.45	319
		Double	2.70	21	3.85	22	4.60	321
		Triple	4.00	23	5.80	24	6.85	323
8	1	Single	1.85	25	2.55	26	2.90	325
		Double	3.20	27	4.60	28	5.30	327
		Triple	4.75	29	6.85	30	7.90	329
9	1 1/16	Single	2.40	31	3.20	32	3.55	331
		Double	4.00	33	5.60	34	6.30	333
		Triple	5.50	35	7.90	36	9.00	335
10	1⅛	Single	3.10	37	4.05	38	4.40	337
		Double	5.10	39	7.00	40	7.70	339
		Triple	7.00	41	9.85	42	11.00	341
12	1¼	Single	5.00	43	6.00	44	6.45	343
		Double	8.25	45	10.35	46	11.15	345
		Triple	11.75	47	14.90	48	16.00	347
14	1⅜	Single	7.50	49	8.75	50	9.10	349
		Double	11.75	51	14.25	52	15.00	351
		Triple	16.50	53	20.25	54	21.30	353

All the above blocks are equivalent to wide mortise wooden blocks, giving plenty of room for the rope.

Our plain, roller bushed, and self lubricating sheaves are interchangeable.

BECKETS

We furnish beckets on all single, two-thirds double, and one-half triple blocks without extra charge. Where a greater proportion is wanted, a slight extra charge is made.

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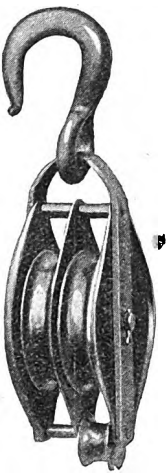
TACKLE BLOCKS

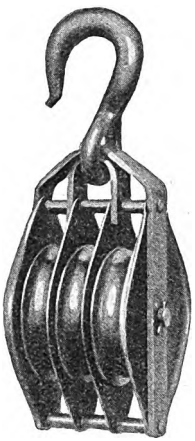
CLEVELAND OVAL STEEL BLOCKS

For Manila Rope

Single



Double



Triple

Length of Shell Inches	Size of Sheave Inches	Diameter of Rope Inches		Plain Bushed Price	Plain Bushed Trade No.	Roller Bushed Price	Roller Bushed Trade No.	Self Lubricating Price	Self Lubricating Trade No.
3	2 x ½	⅜	Single	$0.70	....	....	....	....	.....
			Double	1.35	....	....	....	....	.....
			Triple	1.75	....	....	....	....	.....
4	2¼x 11/16	½	Single	.85	o 1	$1.20	o 2	$1.50	o 301
			Double	1.60	o 3	2.25	o 4	2.90	o 303
			Triple	2.15	o 5	3.25	o 6	4.15	o 305
5	2¾x ⅞	⅝	Single	.90	o 7	1.25	o 8	1.75	o 307
			Double	1.75	o 9	2.35	o 10	3.35	o 309
			Triple	2.25	o 11	3.50	o 12	4.75	o 311
6	3¼x1	¾	Single	1.10	o 13	1.50	o 14	2.20	o 313
			Double	2.00	o 15	2.85	o 16	4.00	o 315
			Triple	2.90	o 17	4.40	o 18	5.80	o 317
7	4¼x1⅛	⅞	Single	1.30	o 19	1.70	o 20	2.50	o 319
			Double	2.40	o 21	3.35	o 22	4.50	o 321
			Triple	3.50	o 23	5.00	o 24	6.70	o 323
8	5 x1¼	1	Single	1.65	o 25	2.25	o 26	3.25	o 325
			Double	2.85	o 27	4.15	o 28	5.70	o 327
			Triple	4.25	o 29	6.00	o 30	8.50	o 329
10	6¼x1⅜	1⅛	Single	2.75	o 37	3.50	o 38	4.75	o 337
			Double	4.50	o 39	6.00	o 40	8.50	o 339
			Triple	6.25	o 41	8.50	o 42	12.50	o 341
12	7½x1½	1¼	Single	4.45	o 43	5.30	o 44	6.75	o 343
			Double	7.50	o 45	9.20	o 46	12.50	o 345
			Triple	10.65	o 47	13.20	o 48	18.50	o 347

Sheaves of the various bushings are interchangeable.

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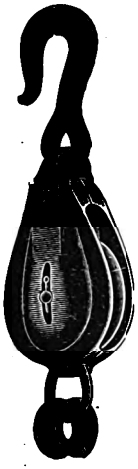
TACKLE BLOCKS

CLEVELAND MALLEABLE TACKLE BLOCKS

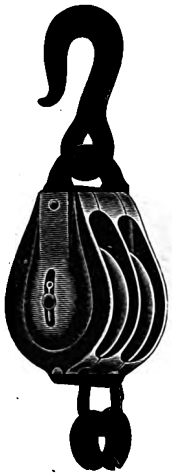
For Manila Rope
Wide Mortise
With Hooks, Rings or Shackles



Single

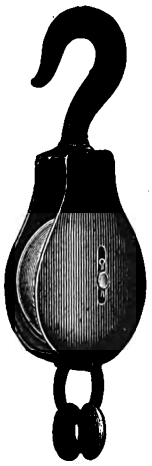
Length of Shell Inches	Size of Sheave Inches	Diameter of Rope Inches		Plain Bushed Price	Plain Bushed Trade No.	Self Lubricating Price	Self Lubricating Trade No.
12	7½x1¾	1½	Single	$6.25	169	$7.85	170
			Double	10.25	171	13.50	172
			Triple	15.00	173	20.00	174
14	8½x1⅞	1¾	Single	9.00	175	10.80	176
			Double	15.00	177	18.50	178
			Triple	20.00	179	25.50	180
16	10 x2¼	2	Single	13.00	181	15.00	182
			Double	21.00	183	25.00	184
			Triple	32.00	185	38.00	186

When ordering heavy purchase blocks, remember that shackles are much stronger than hooks, and for heavy lifting should be used wherever possible. Also, that self lubricating sheaves, on account of their bronze bushings, are far stronger and more durable than any other, and should be used exclusively for heavy work.



Double

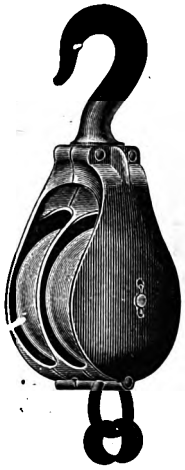
For Manila Rope
Wide Mortise
With Swivel Hooks



Single

Length of Shell Inches	Diameter of Rope Inches		Plain Bushed Price	Plain Bushed Trade No.	Self Lubricating Price	Self Lubricating Trade No.
6	⅞	Single	$2.00	115	$2.85	116
		Double	3.25	117	5.00	118
		Triple	4.50	143	7.15	144
8	1	Single	2.75	119	3.80	120
		Double	4.75	121	6.85	122
		Triple	6.75	145	9.90	146
9	1⅛	Single	3.50	123	4.65	124
		Double	6.00	125	8.30	126
		Triple	8.50	147	11.95	148
10	1¼	Single	4.50	127	5.80	128
		Double	7.50	129	10.00	130
		Triple	10.50	149	14.20	150
12	1½	Single	6.50	131	8.00	132
		Double	11.00	133	14.25	134
		Triple	15.50	151	20.50	152
14	1¾	Single	9.00	135	11.00	136
		Double	15.00	137	18.50	138
		Triple	21.00	153	26.00	154
16	1⅞	Single	13.00	139	15.00	140
		Double	22.00	141	26.00	142
		Triple	31.00	155	37.00	156

Triple with loose swivel only. Single and double furnished with stiff swivel unless otherwise ordered.



Double

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SNATCH BLOCKS

CLEVELAND PATENT AUTOMATIC MALLEABLE SNATCH BLOCKS

Open

For Manila Rope

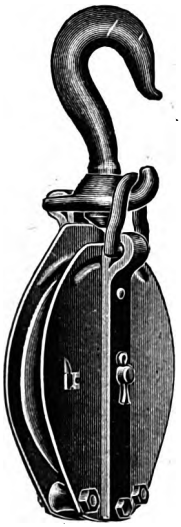
Length of Shell Inches	Size of Sheave Inches	Diameter of Rope Inches	Plain Price	Plain Trade No.	Self Lubricating Price	Self Lubricating Trade No.
7	3½x1¼	⅞	$ 4.75	200	$ 5.50	201
8	4 x1½	1⅛	5.75	202	7.00	203
10	5½x1⅞	1⅜	8.50	204	10.00	205
12	7 x2	1⅝	10.00	206	11.50	207
14	8 x2¼	1⅞	13.00	208	15.00	209
16	9 x2½	2¼	17.00	210	20.00	211

These blocks are simple in construction and very efficient. They have been on the market a number of years and have clearly proven their superiority.

Closed

ANVIL BRAND WROUGHT IRON SNATCH BLOCKS

For Wire Rope

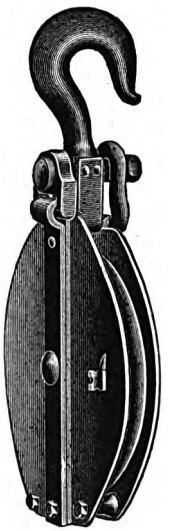


No. 722
Drop Link

Style No. 722 has semi-circular guard pressed in shell over sheave to prevent wire slipping between shell and sheave.

Style No. 723 has center extension piece coming close to the sleeve, preventing the wire rope from leaving the sheave. It also prevents the shell from binding or pinching the sheave.

Diameter Sheave Inches	For Diameter of Rope Inches	Iron Bushed Each	Phosphor Bronze or Metaline Bushed Self Lubricating Each
6	⅜	$11.00	$12.00
8	½	14.00	15.00
10	⅝	16.00	18.00
12	⅝	18.00	21.00
14	¾	20.00	24.00
16	⅞	28.00	33.00
18	1	38.00	44.00
20	1¼	50.00	58.00
20	1½	70.00	78.00



No. 723
Self Clasping
Lock

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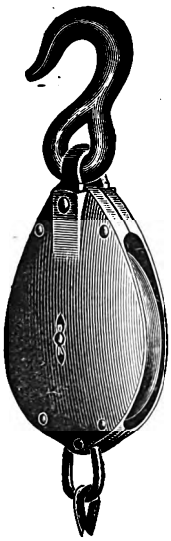
BLOCKS

CLEVELAND WIRE ROPE BLOCKS

Malleable Iron Shells, Steel Fittings

Self Lubricating Phosphor Bronze Sheaves



Length of Shell Inches	Diameter of Sheave Inches	Diameter of Rope Inches		Price	Trade No.
14	10	½ and ⅝	Single	$ 9.50	55
			Double	17.50	57
			Triple	25.50	59
16	12	⅝ and ¾	Single	12.50	61
			Double	23.00	63
			Triple	31.00	65

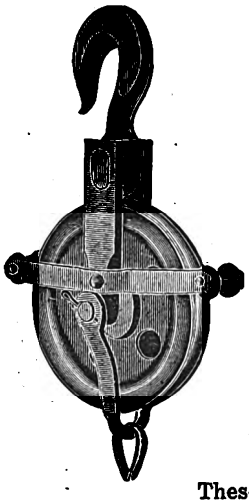
We urge our customers not to try to economize when buying wire rope blocks, by taking smaller sheaves than those listed for the various sizes of wire. A block with sheave of ample diameter will save many times its extra cost, in the longer life of the wire rope.

CLEVELAND PATENT STEEL BLOCKS

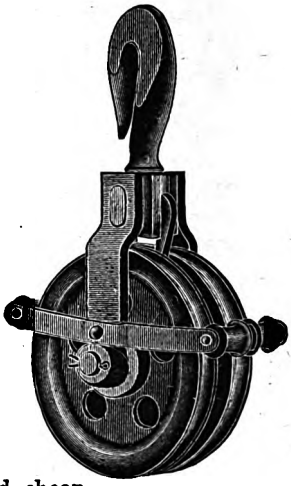
For Wire Rope

Commonly Known as "Gin Blocks"

Self Lubricating



Diam. of Sheave Inches	Diam. of Wire Rope Inches		Price	Trade No.
10	½ and ⅝	Single	$11.00	73
		Double	18.00	75
12	⅝	Single	12.50	77
		Double	20.00	79
14	¾	Single	15.00	81
		Double	23.00	83
16	⅞	Single	18.00	85
		Double	27.00	87
18	1	Single	23.00	89
		Double	32.00	91
20	1⅛	Single	28.00	93
		Double	38.00	95



These wire rope blocks are strong, light and cheap. Roller guards keep the wire rope in place.

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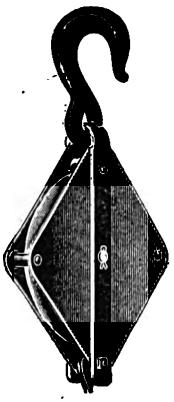
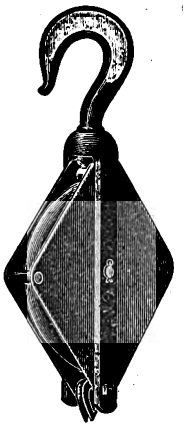
BLOCKS

CLEVELAND HEAVY PATTERN, STEEL DIAMOND FRAME BLOCKS

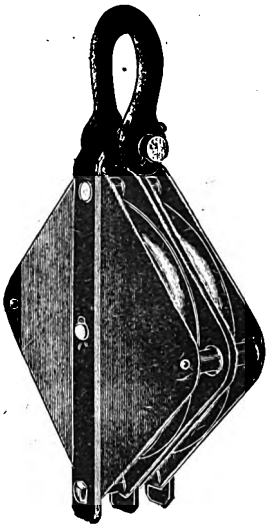
For Wire Rope



Loose Hook



Stiff Swivel Hook



Shackle

Diameter of Sheave Inches	Diameter of Rope Inches		Plain Bushed Price	Plain Bushed Trade No. Loose Hooks	Plain Bushed Trade No. Shackles	Plain Bushed Trade No. Swivel Hooks	Self Lubricating Price	Self Lubricating Trade No. Loose Hooks	Self Lubricating Trade No. Shackles	Self Lubricating Trade No. Swivel Hooks
7½	⅝	Single	$7.50	451	453	455	$10.00	452	454	456
		Double	11.75	457	459	461	16.75	458	460	462
		Triple	17.50	463	465	467	25.00	464	466	468
10	½ & ⅝	Single	14.00	501	503	505	17.00	502	504	506
		Double	20.00	537	539	541	26.00	538	540	542
		Triple	28.00	573	575	577	37.00	574	576	578
12	⅝	Single	15.00	507	509	511	19.00	508	510	512
		Double	22.00	543	545	547	29.00	544	546	548
		Triple	31.00	579	581	583	41.00	580	582	584
14	¾	Single	18.00	513	515	517	21.00	514	516	518
		Double	25.00	549	551	553	31.00	550	552	554
		Triple	36.00	585	587	589	45.00	586	588	590
16	⅞	Single	25.00	519	521	523	30.00	520	522	524
		Double	36.00	555	557	559	45.00	556	558	560
		Triple	45.00	591	593	595	60.00	592	594	596
18	1	Single	32.00	525	527	529	40.00	526	528	530
		Double	44.00	561	563	565	56.00	562	564	566
		Triple	55.00	597	599	601	72.00	598	600	602
20	1⅛	Single	40.00	531	533	535	48.00	532	534	536
		Double	54.00	567	569	571	70.00	568	570	572
		Triple	70.00	603	605	607	90.00	604	606	608

Price on 4, 5 and 6 sheave blocks furnished on application

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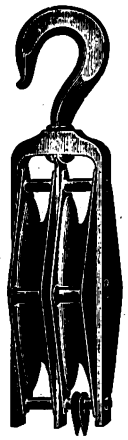
BLOCKS

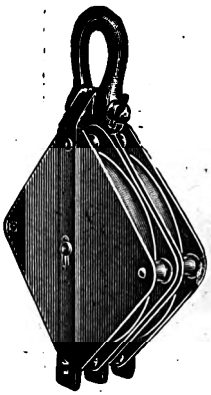
CLEVELAND REGULAR PATTERN, STEEL DIAMOND FRAME BLOCKS

For Wire Rope



Stiff Swivel Hook

Loose Hook



Shackle

Size of Sheave Inches	Diameter of Rope Inches		Plain Bushed Price	Plain Bushed Trade No. Loose Hooks	Plain Bushed Trade No. Shackles	Plain Bushed Trade No. Swivel Hooks	Self Lubricating Price	Self Lubricating Trade No. Loose Hooks	Self Lubricating Trade No. Shackles	Self Lubricating Trade No. Swivel Hooks
6x1 x ¾	⅜	Single	$6.00	5001	5003	5005	$9.00	5002	5004	5006
		Double	11.00	5007	5009	5011	17.00	5008	5010	5012
		Triple	14.00	5013	5015	5017	22.00	5014	5016	5018
8x1 x ¾	½	Single	8.00	5019	5021	5023	11.00	5020	5022	5024
		Double	13.00	5025	5027	5029	19.00	5026	5028	5030
		Triple	16.00	5031	5033	5035	24.00	5032	5034	5036
10x1¼x ⅞	½ & ⅝	Single	10.00	5037	5039	5041	13.00	5038	5040	5042
		Double	15.00	5043	5045	5047	21.00	5044	5046	5048
		Triple	20.00	5049	5051	5053	28.00	5050	5052	5054
12x1½x1	⅝	Single	12.00	5055	5057	5059	15.00	5056	5058	5060
		Double	17.00	5061	5063	5065	23.00	5062	5064	5066
		Triple	23.00	5067	5069	5071	31.00	5068	5070	5072
14x1½x1	¾	Single	14.00	5073	5075	5077	17.00	5074	5076	5078
		Double	19.00	5079	5081	5083	25.00	5080	5082	5084
		Triple	26.00	5085	5087	5089	34.00	5086	5088	5090
16x1½x1¼	⅞	Single	16.00	5091	5093	5095	19.50	5092	5094	5096
		Double	22.00	5097	5099	6001	29.00	5098	6000	6002
		Triple	30.00	6003	6005	6007	40.00	6004	6006	6008

Sheaves are interchangeable with the Heavy Pattern Blocks

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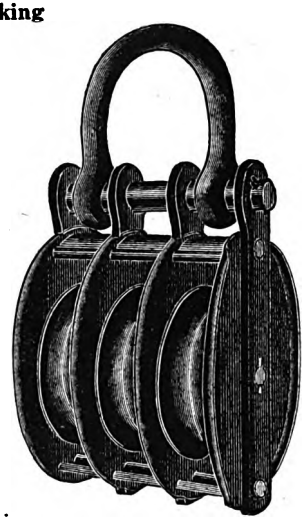
BLOCKS

CLEVELAND EXTRA HEAVY HOISTING BLOCKS

Especially Adapted for Railroad Wrecking

Diameter of Rope Inches		Plain Bushed Price	Plain Bushed Trade No.	Self Lubricating Phosphor Bronze Bushed Price	Self Lubricating Phosphor Bronze Bushed Trade No.
2½	Single	$21.00	401	$32.00	400
	Double	37.00	403	54.00	402
	Triple	54.00	405	77.00	404
3	Single	26.00	407	38.00	406
	Double	48.00	409	70.00	408
	Triple	70.00	411	100.00	410
3½	Single	32.00	413	46.00	412
	Double	56.00	415	85.00	414
	Triple	84.00	417	125.00	416
4	Single	40.00	419	55.00	418
	Double	66.00	421	95.00	420
	Triple	102.00	423	140.00	422

Shells have rounded edges. Steel straps go to the bottom of blocks to stiffen them and to support the becket. Specially designed for lightness and strength.



CLEVELAND EXTRA HEAVY SNATCH BLOCKS

Especially Designed for Railroad Wrecking

Unequaled for strength and stiffness in blocks of this size.

This Cut Shows Extra Heavy Snatch Blocks, Nos. 424 to 430.

Diameter of Rope Inches	Plain Bushed Price	Plain Bushed Trade No.	Self Lubricating Phosphor Bronze Bush. Price	Self Lubricating Phosphor Bronze Bush. Trade No.
2½	$38.00	425	$45.00	424
3	55.00	427	62.00	426
3½	70.00	429	80.00	428
4	90.00	431	100.00	430

CLEVELAND PATENT STEEL SNATCH BLOCKS

For Wire Rope

Diameter of Sheave Inches	Diameter of Rope Inches	Plain Bushed Price	Plain Bushed Trade No.	Self Lubricating Phos. Bronze Bushed Price	Self Lubricating Phos. Bronze Bushed Trade No.
*8	¾	$22.00	225½	$25.00	213½
10	½	16.00	225	18.00	213
12	⅝	18.00	227	21.00	215
14	¾	20.00	229	24.00	217
16	⅞	26.00	231	30.00	219
18	1	34.00	233	40.00	221
20	1⅛	45.00	235	52.00	223

*Extra heavy.

This Cut Shows Patent Steel Snatch Blocks, Nos. 213½ to 223.

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BLOCKS

EXTRA HEAVY OUTSIDE IRON STRAPPED SNATCH BLOCKS

Steel Shell

Flattened Swivel Hooks

Phosphor Bronze Self Lubricating Bushings

For Contractors' and Erectors' Use

Length of Shell Inches	For Rope Diameter Inches	Size of Sheave in Inches	List Price, Each
10	¾	4¼x1 x ⅝	$ 8.55
11	1	5 x1¼x ¾	9.35
12	1¼	5 x1½x ⅞	9.75
14	1½	6½x1¾x1	12.00
15½	1¾	7¼x2 x1⅛	17.50
16½	2	8 x2½x1¼	19.00
18	2½	9 x3 x1½	24.00
21	3	10 x3½x1¾	35.00

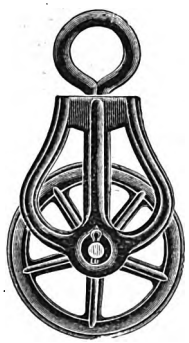
Discount .....

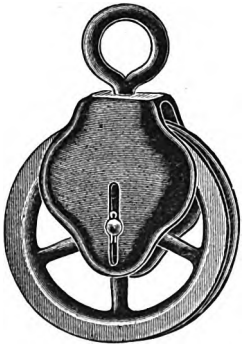
Wood Shell

CLEVELAND HAY FORK BLOCKS

Swivel Eye

No. 1 Knot Passing for Manila Rope — **No. 2 Western Pattern for Wire Rope**



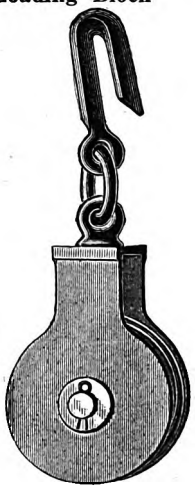


No.	Size of Sheave in Inches	Price	Trade No.
1	5	$0.40	259
2	10	5.00	261

Larger sized hay fork blocks—prices on application.

CLEVELAND BLOCKS FOR SPECIAL PURPOSES

Lumberman's Block — **Loading Block**



Length shell, in.	8
Size sheave, in.	5x1¼
No. 253 Lumberman's, for rope	$3.00
No. 254 Lumberman's, for chain	3.25
No. 257 Loading, for rope	2.50
No. 258 Loading, for chain	2.75

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BLOCKS

REGULAR IRON STRAPPED WOODEN BLOCKS

Single

Double

Triple

Length of Shell Inches	Diameter of Rope Inches		Common Bushed	Roller Bushed	Self Lubricating Phosphor Bronze Bushed
3	⅜	Single	$0.70	$1.10	....
		Double	1.30	2.00	....
		Triple	1.75	2.90	....
3½	⅜	Single	.75	1.15	....
		Double	1.45	2.20	....
		Triple	2.00	3.15	....
4	½	Single	.85	1.20	$1.50
		Double	1.60	2.25	2.90
		Triple	2.15	3.25	4.15
5	⅝	Single	.90	1.25	1.75
		Double	1.75	2.35	3.35
		Triple	2.25	3.50	4.75
6	¾	Single	1.10	1.50	2.20
		Double	2.00	2.85	4.00
		Triple	2.90	4.40	5.80
7	⅞	Single	1.30	1.70	2.50
		Double	2.40	3.35	4.50
		Triple	3.50	5.00	6.70
8	1	Single	1.65	2.25	3.25
		Double	2.85	4.15	5.70
		Triple	4.25	6.00	8.50
9	1	Single	1.85	2.50	3.70
		Double	3.40	4.70	6.75
		Triple	4.75	7.25	10.00

Length of Shell Inches	Diameter of Rope Inches		Common Bushed	Roller Bushed	Self Lubricating Phosphor Bronze Bushed
10	1⅛	Single	$2.75	$3.50	$4.75
		Double	4.50	6.00	8.50
		Triple	6.25	8.50	12.50
11	1⅛	Single	4.45	5.30	6.75
		Double	7.50	9.20	12.50
		Triple	10.65	13.20	18.50
12	1¼	Single	4.45	5.30	6.75
		Double	7.50	9.20	12.50
		Triple	10.65	13.20	18.50
13	1¼	Single	7.00	8.15	9.75
		Double	10.50	12.80	17.00
		Triple	15.00	18.45	25.00
14	1⅜	Single	7.00	8.15	9.75
		Double	10.50	12.80	17.00
		Triple	15.00	18.45	25.00
15	1½	Single	8.00	9.25	11.00
		Double	13.00	15.50	19.50
		Triple	18.00	21.75	28.50
16	1⅝	Single	10.00	11.50	14.00
		Double	15.00	18.00	24.00
		Triple	22.00	26.50	34.00

Beckets

We furnish beckets on all single, two-thirds double, and one-half triple blocks without extra charge. Where a greater proportion is wanted, a slight extra charge is made.

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BLOCKS

HEAVY WOODEN TACKLE
WIDE MORTISE BLOCKS

Single

Double

Triple

Length of Shell Inches	Diameter of Rope Inches		Common Iron Bushed	Roller Bushed	Self Lubricating
6	¾	Single	$2.00	$2.75	$4.00
		Double	3.50	5.00	7.00
		Triple	5.00	7.25	9.00
7	1	Single	2.25	3.00	4.25
		Double	4.00	5.50	7.50
		Triple	5.50	7.75	10.00
8	1⅛	Single	2.75	3.50	5.00
		Double	4.50	6.00	9.00
		Triple	6.30	8.55	13.00
9	1⅛	Single	3.15	4.00	5.75
		Double	5.25	6.95	10.50
		Triple	7.25	9.80	15.00
10	1¼	Single	4.00	5.25	7.25
		Double	6.50	9.00	13.50
		Triple	8.50	12.25	19.00
11	1¼	Single	5.25	6.50	9.25
		Double	8.50	11.00	17.00
		Triple	12.50	16.25	25.00
12	1½	Single	5.25	6.50	9.25
		Double	8.50	11.00	17.00
		Triple	12.50	16.25	25.00
13	1½	Single	8.00	9.75	13.00
		Double	13.00	16.50	23.50
		Triple	17.00	22.25	33.00
14	1¾	Single	8.00	9.75	13.00
		Double	13.00	16.50	23.50
		Triple	17.00	22.25	33.00
15	1¾	Single	9.00	11.00	15.00
		Double	15.00	19.00	26.50
		Triple	20.00	26.00	37.00
16	2	Single	11.50	14.00	18.00
		Double	18.00	23.00	32.00
		Triple	28.00	35.50	48.00

Discount .....

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BLOCKS

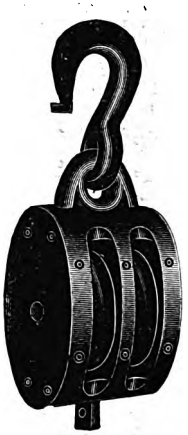
EXTRA HEAVY PURCHASE WOOD BLOCKS

Double Cross Riveted Flattened Hooks of Double Refined Iron Sheaves Self Lubricating Phosphor Bronze Bushed

Single

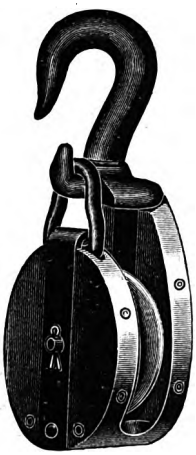
Size of Block Inches	Size of Sheave Inches	Size of Rope in Inches	Single	Double	Triple
12	7½x2 x ¾	1½	$ 6.95	$10.00	$12.90
14	8½x2 x ⅞	1⅝	9.00	12.25	16.50
16	10¼x2¼x1	1¾	12.40	18.50	21.20
18	11 x2⅝x1⅛	2	18.80	24.50	29.00
20	12 x2¾x1¼	2¼	22.00	31.50	38.50
22	13½x2⅞x1⅜	2½	26.50	36.00	44.00
24	15 x3 x1⅜	2¾	31.00	41.00	50.00
Special					
16	10 x2⅜x1⅛	2	14.50	20.75	24.75

Discount .....



Double

WOODEN SNATCH BLOCKS



Length of Shell Inches	Diameter of Rope Inches	Common Iron Bushed	Patent Roller Bushed	Self Lubricating Phos. Bronze Bushed
6	⅞	$ 4.00	$ 4.65	$ 5.25
7	⅞	4.75	5.50	6.00
8	1	5.75	6.60	7.25
9	1⅛	6.75	7.75	8.50
10	1¼	8.50	10.00	11.00
12	1½	10.00	11.50	13.00
14	1¾	13.00	15.00	16.50
16	2	17.00	20.00	22.00
18	2¼	25.00	28.50	31.00
20	2½	38.00	43.00	46.00
22	3	55.00	63.00	68.00
24	3½	70.00	78.00	86.00
26	4	90.00	....	110.00

Discount 6-16 in. .....

Discount 18-26 in. .....

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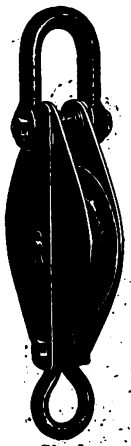
BLOCKS

PRODUCERS' STEEL SHELL BLOCKS

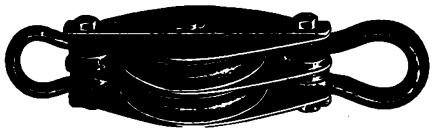
Heavy Pattern, for Manila or Wire Rope

Outside Iron Strapped

Self Lubricating Phosphor Bronze Bushed



Single



Double

Triple

Size in Inches	Diam. of Sh've	Dia. of Rope Manila	Dia. of Rope Wire	Single Each	Single Wgt.	Double Each	Double Wgt.	Triple Each	Triple Wgt.
20	12	2⅛	⅞	$16.50	115	$26.00	160	$35.00	210
22	14	2⅛	1	22.00	135	30.00	200	44.00	280
24	15½	2½	1	25.50	170	37.00	260	52.00	350
26	16½	2½	1¼	28.00	195	42.00	290	58.00	390
28	18½	2½	1¼	34.00	220	48.00	340	62.00	450
30	22	2½	1¼	40.00	260	60.00	400	76.00	570

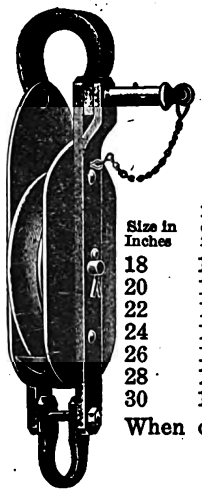
Discount .....

PRODUCERS' SNATCH BLOCKS

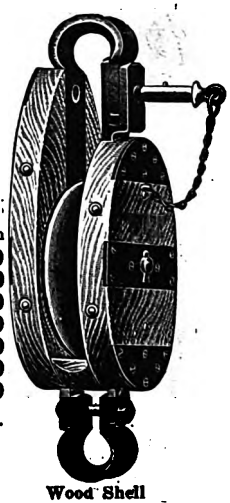
Extra Heavy Pittsburgh Pattern

Sheaves are Interchangeable
For Manila and Wire Rope

Self Lubricating Phosphor Bronze Sheaves



Steel Shell



Wood Shell

Size in Inches	Diameter of Sheave in Inches	Diam. of Rope Manila	Diam. of Rope Wire	Weight Wood	Weight Iron	Price, Each
18	10x2⅜	2⅛	⅞	68	67	$15.00
20	11x2⅜	2⅛	⅞	95	90	17.00
22	12x2⅝	2⅛	1	110	105	19.00
24	14x2⅞	2½	1	155	150	21.00
26	15x3	2½	1¼	195	190	25.50
28	16x3⅛	2½	1¼	230	200	30.00
30	18x3⅛	2½	1¼	285	275	37.00

When ordering, state whether for Manila or Wire Rope.

Discount .....

DOUBLE SWIVEL HOOKS

For Producers' Snatch Blocks

Size Hook in In.	For Block in In.	Weight in Pounds	Price Each	Size Hook in In.	For Block in In.	Weight in Pounds	Price Each
1¾	14 & 16	21	$ 7.00	4	30	180	$ 42.00
2	18	27	8.00	4½	30	205	60.00
2⅜	20	55	12.50	5	30	260	75.00
2⅝	22	64	15.00	5½	30	330	85.00
2¾	24	80	16.50	6½	30	445	155.00
3	26	90	20.00	7	30	790	.....
3½	28	130	32.50				

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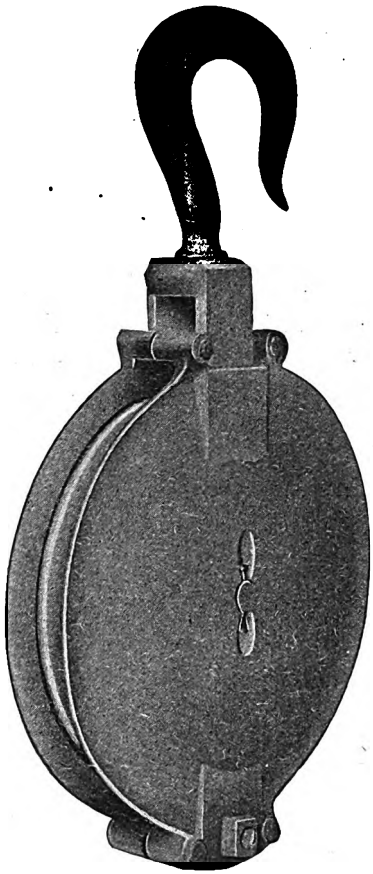
MALLEABLE IRON CHEEK BLOCKS



These blocks are made of malleable iron of great tensible strength with reinforced rims and cheeks, close fitting sheaves, accurately machined bearings and case hardened center pins.

The above qualities insure the greatest possible service.

Furnished black unless otherwise specified. When ordering, state whether for wire or manila rope. This style carried in stock or made to blue prints and specifications.

Prices on application.

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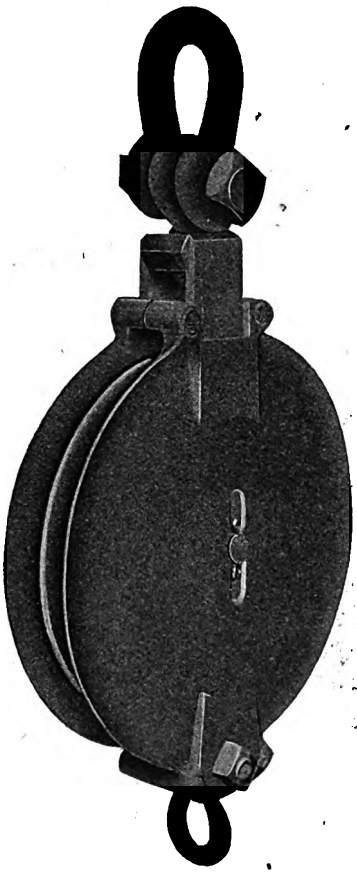
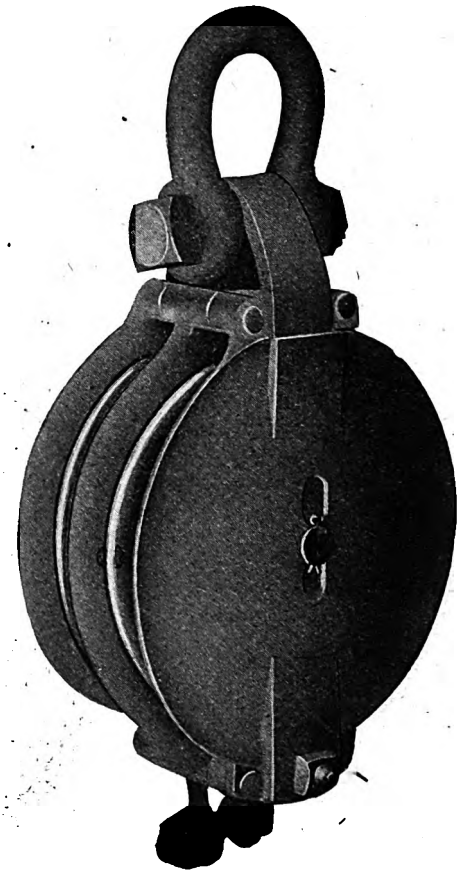
MALLEABLE IRON CHEEK BLOCKS





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These styles carried in stock or made to blue prints and specifications.

Prices on application.

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SHEAVES

IRON SHEAVES FOR MANILA ROPE TACKLE BLOCKS

Size in Inches Diameter	Size in Inches Width	Plain Bushed	Roller Bushed	Self Lubricating Phos. Bronze Bushed
1¾	½	$0.09	$0.40	....
2	½	.10	.42	....
2¼	⅝	.12	.45	....
2¼	11/16	.13	....	$0.90
2¾	¾	.15	.50	.90
2¾	⅞	.15	.65	.95
3	¾	.20	.55	.90
*3	1⅛	.30	.75	1.40
3¼	1	.25	.75	1.10
3½	⅞	.22	.75	1.07
3½	1	.25	.75	1.10
3½	1¼	.28	....	1.25
*3½	1¼	.40	.85	1.60
4	1	.27	.85	1.12
4	1¼	.30	1.00	1.15
4	1½	.35	...	1.50
4¼	⅞	.28	...	1.13
4¼	1	.30	...	1.15
4¼	1⅛	.33	.90	1.30
4½	1	.32	.95	1.17
4½	1⅛	.35	1.00	1.30
4½	1⅜	.38	1.20	1.40
*4½	1⅜	.50	1.20	1.90
4½	1½	.40	...	1.50
4¾	1⅛	.35	1.00	1.30
4¾	1⅜	.40	1.15	1.50
5	1⅛	.35	1.10	1.30
5	1¼	.40	1.10	1.45
5	1⅜	.45	1.25	1.50
*5	1⅜	.60	1.30	2.00
5	1½	.50	1.30	1.50
5	2	.55	...	1.85
5⅜	1⅜	.50	1.25	...
5½	1	.45	1.15	1.20
5½	1⅛	.50	1.20	1.35
5½	1 5/16	.50	1.30	1.65
5½	1½	.50	...	1.50
5½	1⅞	.70	...	2.00
*5¾	1⅞	1.20	2.40	3.00
6	1	.55	...	1.20
6	1¼	.60	1.45	1.45
6	1½	.65	1.60	2.00
6	2	.85	2.10	2.45
6¼	1¼	.60	1.35	1.85
6¼	1⅜	$0.65	$1.60	$1.95
6¼	1½	.70	1.60	2.00
*6¾	2⅛	1.50	2.85	3.75
7	1¼	.70	1.60	2.00
7	1½	.80	1.80	2.10
7	1¾	.90	2.00	2.30
7	2	1.10	2.40	2.90
7¼	1¼	.70	...	1.65
7½	1¼	.80	1.75	2.10
7½	1⅜	.90	1.85	2.20
7½	1⅝	1.05	2.05	2.40
7½	2	1.25	2.50	3.00
8	1⅜	.95	1.90	2.25
8	1½	1.05	2.10	2.45
8	1⅝	1.10	2.10	2.50
8	1¾	1.20	2.25	2.80
8	2	1.40	3.30	3.00
8	2¼	1.65	...	3.40
*8	2¼	1.85	3.45	4.50
8½	1⅝	1.25	2.50	2.85
8½	1⅞	1.40	...	3.00
9	1½	1.20	2.40	2.45
9	1¾	1.35	2.55	...
*9	2½	2.25	...	4.25
*9	2⅝	2.25	4.50	5.50
9½	1⅝	1.40	2.65	2.85
9½	1⅞	1.50	2.85	...
9½	2	1.70	...	3.20
10	1⅜	1.40	...	2.85
10	1½	1.50	2.80	2.95
10	1⅝	1.50	2.85	...
10	1¾	1.75	3.15	3.25
10	1⅞	1.70	3.15	...
10	2	2.00	4.00	3.75
10	2¼	2.40	5.40	4.40
*10	3	3.00	6.00	7.00
11	1¾	1.70	3.20	...
*11	2	2.30	...	4.00
11	2¼	2.00	3.50	...
*11	3½	4.00	8.00	9.00
11½	3¾	6.50	11.50	...
12	2	3.00	5.00	5.00
12	4⅜	9.00	15.00	18.00

The sizes above are regularly carried in stock in the bushings shown. Other sizes can be furnished on short notice at proportionate prices. Lignum Vitae Sheaves for Manila Rope, also Galvanized Iron Sheaves, can be furnished promptly.

*Heavy pattern. Prices on application.

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SHEAVES

IRON SHEAVES FOR WIRE ROPE

Self Lubricating

Diameter in Inches	Thickness Across Edge Inches	Size Pin in Inches	Thickness Through Hub in Inches	Size of Wire Rope in Inches	Plain Bushed	Self Lubricating Phos. Bronze Bushed
5	¾	⅝	⅞	⅜	$0.50	$1.60
6	⅞	⅝	1	⅜	.75	2.00
6	1	¾	1 1/16	½	.75	2.00
6	1⅛	¾	1¼	⅝	1.00	2.50
6	1½	⅞	1⅝	¾	1.25	2.75
6	1¾	1	1⅞	⅞	1.60	3.40
6 solid	2	1	2⅛	1	2.50	4.30
7 solid	2	1	2⅛	1	3.25	5.00
7½	¾	⅝	⅞	⅜	.90	2.30
8	1⅛	¾	1¼	½	1.75	2.75
8	1⅜	1	1⅞	⅝	1.75	3.00
8	1⅜	1	1⅞	¾	2.00	3.75
8 solid	2	1⅛	2⅛	⅞ & 1	3.75	6.00
10 light	1⅛	¾	1¼	½	1.50	3.00
10	1	¾	1⅛	⅜	2.25	3.60
10	1½	1	1⅝	½	2.40	3.85
10	1½	1	1⅝	⅝	2.65	4.60
10	1½	1	1⅝	¾	2.75	4.60
10	1⅝	1⅛	1¾	⅞	3.25	5.60
12	1⅛	1	1¼	½	3.00	5.00
12	1⅝	1	1¾	⅝	3.00	5.50
12	1⅝	1⅛	1¾	¾	3.60	5.75
12	1¾	1¼	2	⅞	4.00	6.50
12	1⅞	1¼	2	1	4.00	6.50
14	1½	1⅛	1⅝	⅝	4.25	6.50
14	1¾	1⅛	1⅞	¾	4.25	6.50
14	1¾	1¼	2	⅞	4.75	7.50
16	1½	1⅛	1⅝	⅝	6.00	8.00
16	1¾	1⅛	1⅞	¾	6.25	8.25
16	1¾	1¼	1⅞	⅞	6.50	8.50
16	1¾	1½	1⅞	⅞	6.75	10.00
18	1½	1¼	1¾	⅝ & ¾	8.75	11.00
18	1½	1½	1¾	⅝ & ¾	8.75	11.50
18	2	1¼	2¼	⅞ & 1	10.00	12.50
18	2	1½	2¼	⅞ & 1	10.00	13.00
20	1¾	1¼	2	⅝	9.25	11.50
20	1⅞	1¼	2⅛	¾	12.00	15.00
20	2⅛	1¼	2⅜	1 & 1⅛	12.50	15.50
20	2⅛	1½	2⅜	1 & 1⅛	12.50	16.50
24	2¼	1½	2½	1	18.00	22.00
24	2½	1½	2¾	1¼	20.00	24.00

The sizes above are regularly carried in stock. Other sizes can be furnished on short notice. Also Iron Sheaves for chain in various sizes.

Prices on application.

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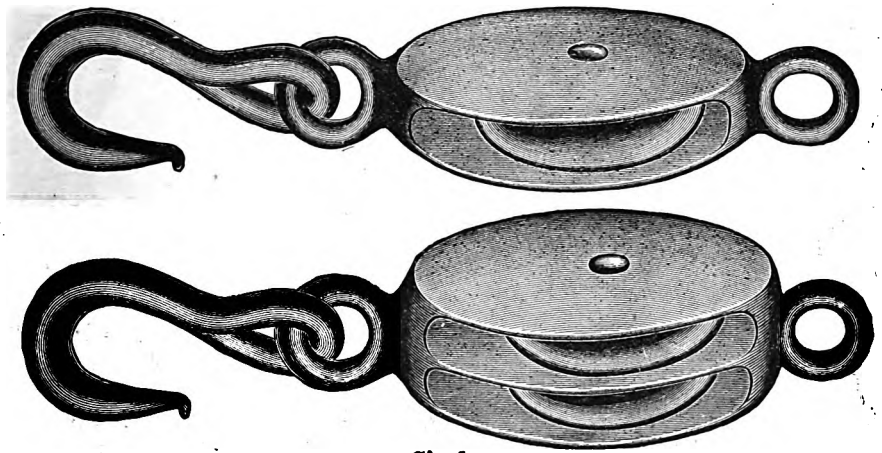
LOOSE HOOK BLOCKS

Galvanized Wrought Iron Hooks

Malleable Iron Shells



Single

Size No.	Length of Shell Inches	Diameter of Rope Inch	SHEAVE Diameter Inches	SHEAVE Thick Inch	Common Galvanized Each	Patent Galvanized Each	Patent Brass Each	Galvanized Ball Bearing Each
1	1⅜	3/16	¾	5/16	$0.19	....	....	....
3	1⅝	¼	1	11/32	.22	....	....	....
5	2	5/16	1⅜	7/16	.25	....	....	....
7	2¼	⅜	1½	½	.31	$0.58	$0.79	$0.88
9	2¾	7/16	1¾	½	.43	.70	.92	1.00
11	3	½	2	⅝	.48	.80	1.04	1.13
13	3¾	⅝	2½	¾	.75	1.08	1.40	1.48
15	4¾	¾	3	⅞	1.10	1.50	2.08	2.17

Double

Size No.	Length of Shell Inches	Diameter of Rope Inch	SHEAVE Diameter Inches	SHEAVE Thick Inch	Common Galvanized Each	Patent Galvanized Each	Patent Brass Each	Galvanized Ball Bearing Each
2	1⅜	3/16	¾	5/16	$0.23	....	....	....
4	1¾	¼	1	11/32	.27	....	....	....
6	2	5/16	1⅜	⅜	.32	....	....	....
8	2¼	⅜	1½	½	.38	$0.95	$1.37	$1.55
10	3	7/16	1¾	½	.50	1.06	1.45	1.63
12	3¼	½	2	⅝	.60	1.20	1.73	1.88
14	4	⅝	2½	¾	.95	1.62	2.23	2.33
16	5	¾	3	⅞	1.35	2.14	3.33	3.50

Above blocks with or without beckets take same list

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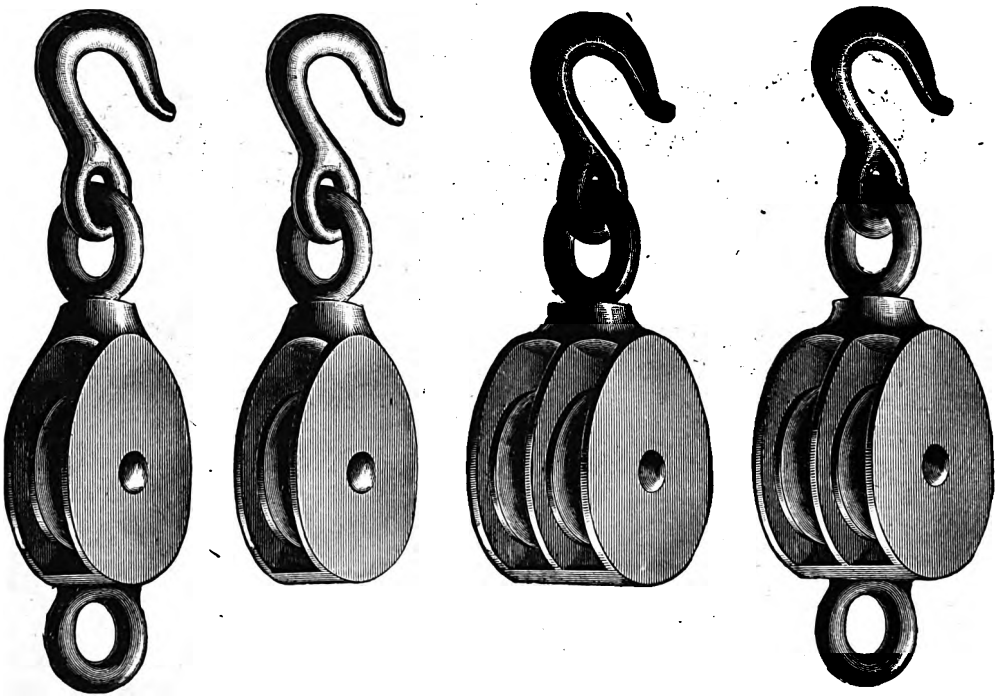
LOOSE HOOK BLOCKS

Galvanized Malleable Iron



Single

Size No.	Length of Shell Inches	Diameter of Rope Inch	SHEAVE Diameter Inches	SHEAVE Thick Inch	Price Each
0	1	1/8	11/16	3/16	$0.18
1	1 3/8	3/16	3/4	5/16	.20
3	1 3/4	1/4	1	11/32	.22
5	2	5/16	1 3/8	3/8	.25
7	2 1/4	3/8	1 1/2	1/2	.32

Double

Size No.	Length of Shell Inches	Diameter of Rope Inch	SHEAVE Diameter Inches	SHEAVE Thick Inch	Price Each
00	1	1/8	11/16	3/16	$0.20
2	1 3/8	3/16	3/4	5/16	.23
4	1 3/4	1/4	1	11/32	.27
6	2	5/16	1 3/8	3/8	.33
8	2 1/4	3/8	1 1/2	1/2	.38

Above blocks with or without beckets take same list

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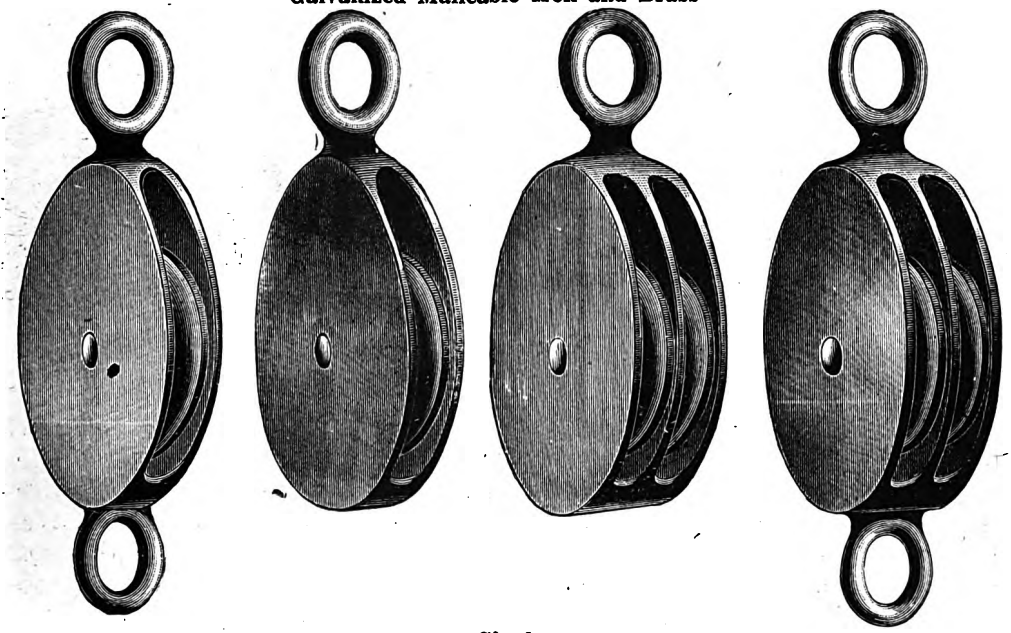
FAST EYE BLOCKS

Galvanized Malleable Iron and Brass



Single

Size No.	Length of Shell Inches	Diameter of Rope Inch	SHEAVE Diameter Inches	SHEAVE Thick Inch	Galvanized Each	Plain Brass Each	Polished Brass Each
0	1⅛	⅛	¾	5/16	$0.05	$0.08	$0.17
1	1⅜	3/16	¾	5/16	.05	.10	.23
3	1⅝	¼	1	11/32	.07	.20	.33
5	2	5/16	1⅜	7/16	.11	.30	.45
7	2¼	⅜	1½	½	.16	.33	.50
9	2¾	7/16	1¾	½	.25	.50	.70
11	3	½	2	⅝	.29	.75	.96
13	3¾	⅝	2½	¾	.62	....	....
15	4¾	¾	3	⅞	.90	....	....

Double

Size No.	Length of Shell Inches	Diameter of Rope Inch	SHEAVE Diameter Inches	SHEAVE Thick Inch	Galvanized Each	Plain Brass Each	Polished Brass Each
00	1	⅛	11/16	5/16	$0.06	$0.10	$0.23
2	1⅜	3/16	¾	5/16	.09	.16	.29
4	1¾	¼	1	11/32	.13	.30	.44
6	2	5/16	1⅜	⅜	.18	.42	.58
8	2¼	⅜	1½	½	.23	.50	.70
10	3	7/16	1¾	½	.33	.70	.92
12	3¼	½	2	⅝	.41	.92	1.16
14	4	⅝	2½	¾	.77	....	....
16	5	¾	3	⅞	1.12	....	....

Furnished with patent roller sheaves to order

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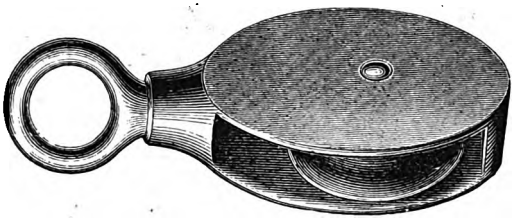
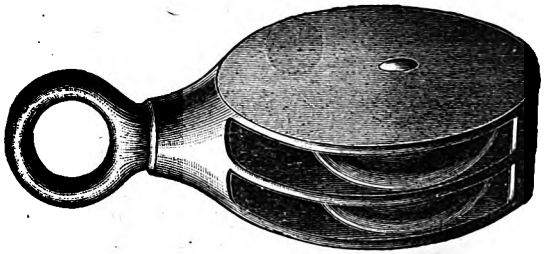
BLOCKS

SWIVEL EYE AWNING BLOCKS

Galvanized Malleable Iron and Brass

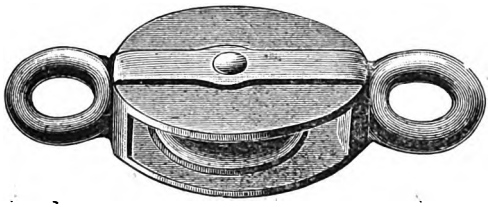


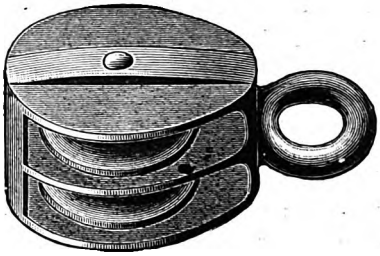


Length Shell Inches	Diam. Rope Inch	Sheave Diam. Inches	Sheave Thick Inch	Single Size No.	Single Galvanized Dozen	Single Plain Brass Dozen	Single Polished Brass Dozen	Double Size No.	Double Galvanized Dozen	Double Plain Brass Dozen	Double Polished Brass Dozen
7/8	3/16	9/16	5/16	3/0	$0.55	$0.90	$2.00	4/0	$0.70	$1.25	$2.70
1 3/8	3/16	3/4	5/16	1	.65	1.25	2.70	2	1.10	2.00	3.50
1 3/4	1/4	1	11/32	3	.90	2.50	4.00	4	1.60	3.75	5.25
2	5/16	1 3/8	3/8	5	1.40	3.75	5.25	6	2.25	5.00	7.00
2 1/4	3/8	1 1/2	1/2	7	2.00	4.00	6.00	8	2.80	6.00	8.50

FAST EYE BLOCKS

Galvanized Cast Iron, for Arc Lights, Etc.





Length of Shell Inches	Shell Diam. Diam Rope Inch	Sheave Diam. Inches	Sheave Thick Inch	Single Size No.	Single With or Without Becket Each	Double Size No.	Double With or Without Becket Each
3	1/2	1 3/4	9/16	1	$0.60	2	$0.85
3 1/2	5/8	2 1/4	3/4	3	.75	4	1.00

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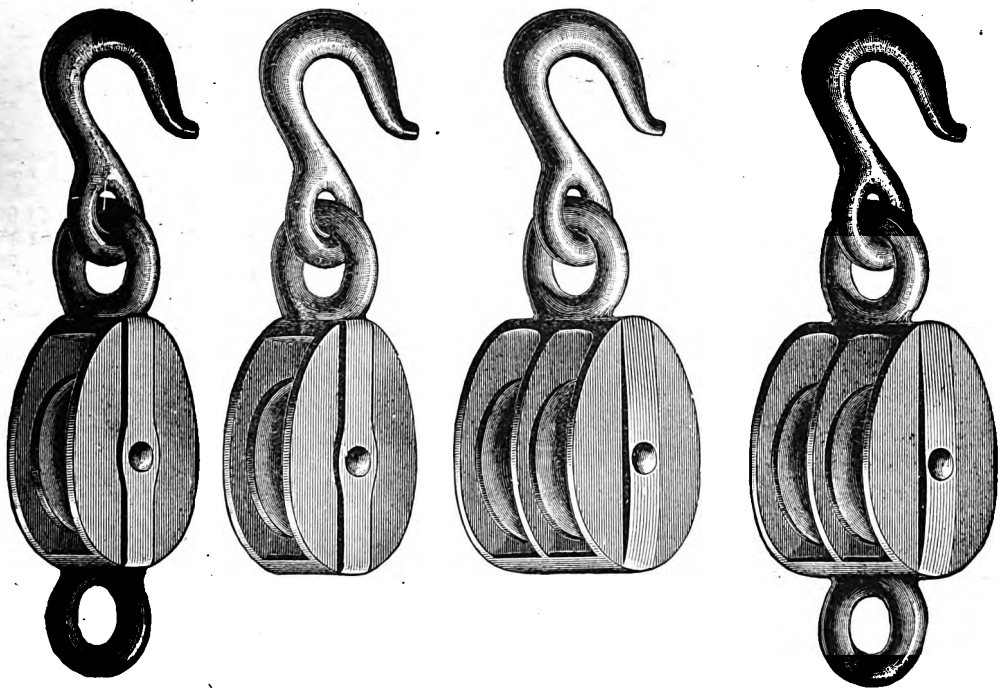
BLOCKS

Galvanized Cast Iron

For Arc Lights, Etc. With Loose Hooks



Single

Size No.	Length of Shell Inches	Diameter of Rope Inch	Sheave Diameter Inches	Sheave Thick Inch	With or Without Becket Each
1	3	½	1¾	9/16	$0.90
3	3½	⅝	2¼	¾	1.05

Double

Size No.	Length of Shell Inches	Diameter of Rope Inch	Sheave Diameter Inches	Sheave Thick Inch	With or Without Becket Each
2	3	½	1¾	9/16	$1.10
4	3½	⅝	2¼	¾	1.30

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BLOCKS

WHEEL ROPE OR CHEEK BLOCKS

Galvanized Iron and Brass
For Wire or Manila Rope

For Wire Rope

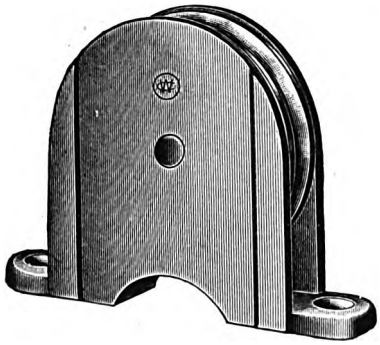
Size No.	Diameter of Rope Inches	Diameter Sheave Inches	Thickness Sheave Inch	Galvanized Each	Plain Brass Each	Polished Brass Each
1	¼ & 5/16	1⅞	7/16	$0.50	$0.75	$1.00
2	5/16 & ⅜	3	9/16	.75	1.00	1.35
3	⅜ & 7/16	4	⅝	1.25	2.00	2.50
4	½ & ⅝	5	15/16	2.00	3.00	4.00
5	¾	6	1	2.75	4.00	5.25

For Manila Rope

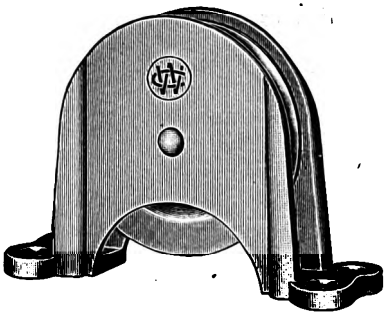
Size No.	Diam. of Rope, In.	Diam. Sheave, In.	Thickness Sheave, In.	Galvanized Each
40	⅝	4¾	⅞	$2.00
50	¾	6	1	2.75

DECK BLOCKS

Wire Rope



Manila Rope



For Wire Rope

Size No.	Diameter of Rope Inches	Diameter Sheave Inches	Thickness Sheave Inch	Galvanized Each	Plain Brass Each	Polished Brass Each
1	¼ & 5/16	1⅞	7/16	$0.50	$0.75	$1.00
2	5/16 & ⅜	3	9/16	.75	1.00	1.35
3	⅜ & 7/16	4	⅝	1.25	2.00	2.50
4	½ & ⅝	5	15/16	2.00	3.00	4.00
5	¾	6	1	2.75	4.00	5.25

For Manila Rope

Size No.	Diam. of Rope, In.	Diam. Sheave, In.	Thickness Sheave, In.	Galvanized Each
45	⅝	4¾	⅞	$2.00
55	¾	6	1	2.75

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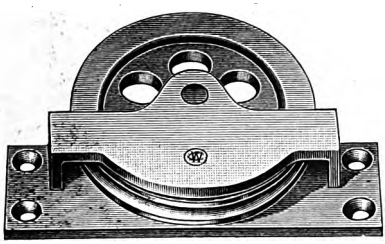
PULLEYS AND BLOCKS

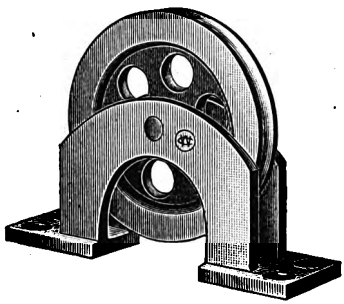
WIRE ROPE PULLEYS

Galvanized Malleable Iron and Brass

Side



Upright



Single

Size No.	Diameter of Rope Inches	Sheave Diameter Inches	Sheave Thick Inch	Galvanized Each	Plain Brass Each	Polished Brass Each
1	3/16	2½	11/32	$0.50	$0.75	$1.00
2	¼	3¼	7/16	.75	1.10	1.70
3	5/16 & ⅜	4½	9/16	1.50	2.25	3.00

Double

11	3/16	2½	11/32	1.00	1.50	2.00
12	¼	3¼	7/16	1.50	2.20	3.40
13	5/16 & ⅜	4½	9/16	3.00	4.50	6.00

SNATCH BLOCKS

Galvanized Malleable Iron and Brass

With Eye

Size No.	Diameter of Rope Inch	Sheave Diameter Inches	Sheave Thick Inch	Galvanized Dozen	Plain Brass Dozen	Polished Brass Dozen
1	5/16	1¼	⅜	$2.00	$4.00	$5.50
2	⅜	1½	½	2.50	5.00	7.00
3	½	1¾	⅝	3.50	6.00	9.00

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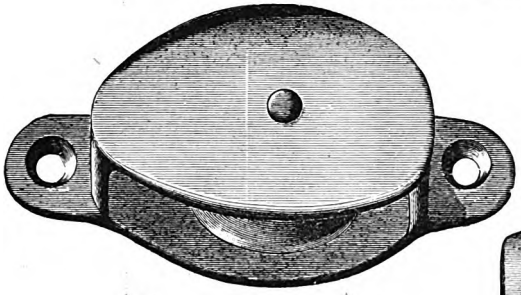
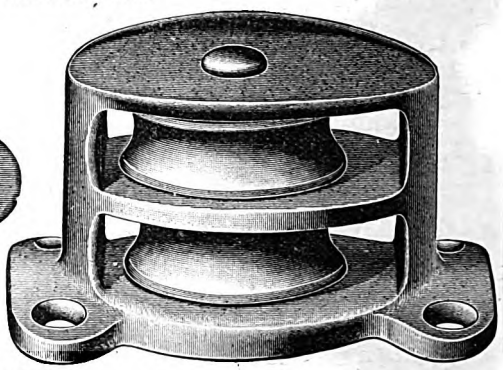
CHEEK HALYARD BLOCKS

Galvanized Iron and Brass





Iron, Single

Size No.	Diameter of Rope Inch	Sheave Diameter Inches	Sheave Thick Inch	Malleable Common Galvanized Sheave Each	Malleable Patent Galvanized Sheave Each	Malleable Patent Brass Sheave Each	Cast Common Galvanized Sheave Each
0	¼	1⅛	⅜	$0.30	....	....	$0.25
1	5/16	1¼	7/16	.35	$0.50	$0.75	.30
2	⅜	1½	½	.45	.80	1.00	.35
3	½	2	⅝	.60	1.00	1.25	.60
4	⅝	2½	¾	.70	1.50	1.90	....
5	¾	3	⅞	....	1.75	2.25	.90
6	⅞	3½	1	....	....	....	1.20

Iron, Double

Size No.	Diameter of Rope Inch	Sheave Diameter Inches	Sheave Thick Inch	Common Galvanized Sheave Each
11	5/16	1¼	7/16	$0.45
12	⅜	1½	½	.55
13	½	2	⅝	.65

Brass, Single

Size No.	Diameter of Rope Inch	Sheave Diameter Inches	Sheave Thick Inch	Plain Common Brass Sheave Each	Plain Patent Brass Sheave Each	Polished Common Brass Sheave Each	Polished Patent Brass Sheave Each
0	¼	1⅛	⅜	$0.50	....	$0.75	....
1	5/16	1¼	7/16	.60	$1.00	.85	$1.50
2	⅜	1½	½	.70	1.25	.95	1.75
3	½	2	⅝	.95	1.50	1.20	2.00
5	¾	3	⅞	....	2.75	....	3.25

Brass, Double

Size No.	Diameter of Rope Inch	Sheave Diameter Inches	Sheave Thick Inch	Plain Common Brass Sheave Each	Plain Patent Brass Sheave Each	Polished Common Brass Sheave Each	Polished Patent Brass Sheave Each
11	5/16	1¼	7/16	$0.80	$1.80	$1.25	$2.25
12	⅜	1½	½	.90	2.00	1.40	2.50
13	½	2	⅝	1.40	3.00	2.00	3.50

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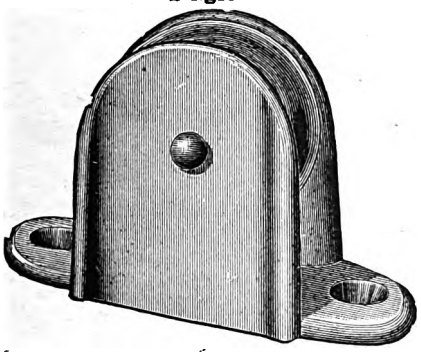
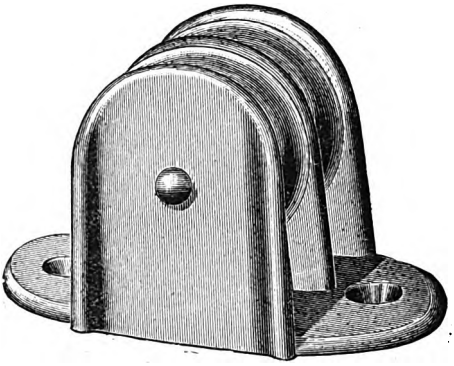
DECK HALYARD BLOCKS

Galvanized Iron and Brass

Single



Double



Single, Iron

Size No.	Diameter of Rope Inch	Sheave Diameter Inches	Sheave Thick Inch	Malleable Common Galvanized Sheave Each	Malleable Patent Galvanized Sheave Each	Malleable Patent Brass Sheave Each	Cast Common Galvanized Sheave Each
000	¼	1	5/16	....	....	....	$0.13
0	5/16	1¼	⅜	$0.20	....	....	.15
1	⅜	1½	½	.25	$0.55	$0.75	.20
3	½	2	⅝	.40	.90	1.10	.30
5	⅝	2½	¾	.65	1.10	1.50	.55
7	¾	3	⅞	1.10	1.60	2.00	1.00

Single, Brass

Size No.	Diameter of Rope Inch	Sheave Diameter Inches	Sheave Thick Inch	Plain Common Brass Sheave Each	Plain Patent Brass Sheave Each	Polished Common Brass Sheave Each	Polished Patent Brass Sheave Each
000	¼	1	5/16	$0.35	....	$0.75	....
0	5/16	1¼	⅜	.40	....	.80	....
1	⅜	1½	½	.50	$1.00	.90	$1.40
3	½	2	⅝	1.00	1.50	1.50	2.00
5	⅝	2½	¾	1.50	2.00	2.00	2.50
7	¾	3	⅞	2.25	3.00	2.75	3.50

Double, Iron

Size No.	Diameter of Rope Inch	Sheave Diameter Inches	Sheave Thick Inch	Malleable Common Galvanized Sheave Each	Malleable Patent Galvanized Sheave Each	Malleable Patent Brass Sheave Each	Cast Common Galvanized Sheave Each
2	⅜	1½	½	$0.50	$1.00	$1.50	$0.35
4	½	2	⅝	.80	1.50	2.00	.60

Double, Brass

Size No.	Diameter of Rope Inch	Sheave Diameter Inches	Sheave Thick Inch	Plain Common Brass Sheave Each	Plain Patent Brass Sheave Each	Polished Common Brass Sheave Each	Polished Patent Brass Sheave Each
2	⅜	1½	½	$0.90	$1.75	$1.25	$2.00
4	½	2	⅝	1.75	2.75	2.25	3.25

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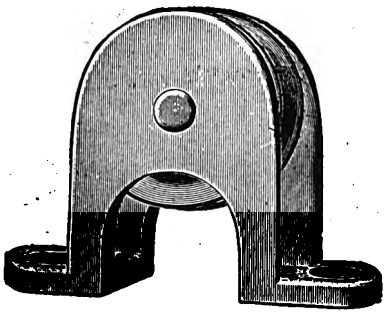
BLOCKS AND CLEATS

DECK HALYARD BLOCKS

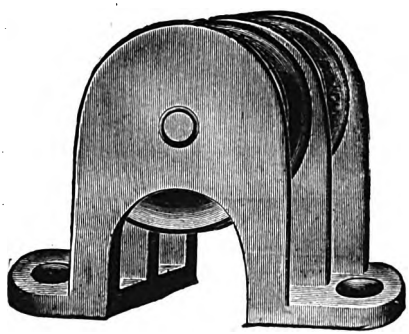
Galvanized Cast Iron and Brass

Single. Open Pattern



Size No.	Diameter of Rope Inch	Sheave Inches	Galvanized Each	Polished Brass Each
0	5/16	1¼x⅜	$0.15	$0.80
1	⅜	1½x½	.20	.90
3	½	2 x⅝	.30	1.50
5	⅝	2½x¾	.55	2.00
7	¾	3 x⅞	1.00	2.75

Double. Open Pattern

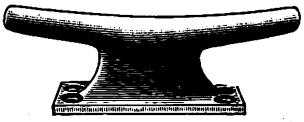


Size No.	Diameter of Rope Inch	Sheave Inches	Galvanized Each	Polished Brass Each
2	⅜	1½x½	$0.35	$1.25
4	½	2 x⅝	.60	2.25

BOAT CLEATS

Galvanized Iron and Brass

Square Base



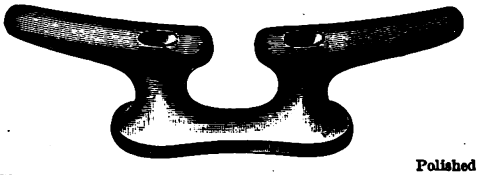
Size No.	Length Inches	Galvanized Each	Polished Brass Each
1	2	$0.05	$0.12
1½	2¾	.05	.18
2	3¼	.07	.25
3	3¾	.09	.35
4	4½	.15	.42
5	5½	.17	.62
6	6	.25	.85

Open Base

Size No.	Length Inches	Galvanized Each	Polished Brass Each
7	3½	$0.09	$0.25
8	4½	.12	.30
9	5½	.14	.40
10	6	.20	.55
11	7	.24	.65
12	8	.30	.95
13	9	.38	1.25
14	10	.50	1.65
15	12	.75	2.10
16	14	1.25	3.50
17	18	1.50	....

MAIN SHEET CLEATS

Galvanized Iron and Brass



Size No.	Length Inches	Galvanized Each	Polished Brass Each
1	6	$0.20	$0.75
2	7	.25	1.00
3	9	.35	1.75
4	12	.75	3.25
5	15	1.00	4.25
6	18	1.25	5.00

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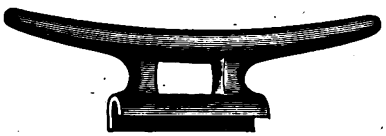
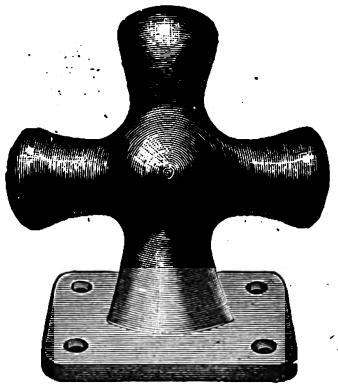
CLEATS AND BITTS

WIRE STAY CLEATS
Galvanized Iron and Brass



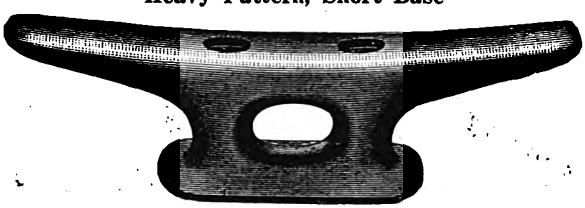
Size No.	Length Inches	Galvanized Each	Polished Brass Each
1	3½	$0.14	$0.35
2	4½	.15	.40
3	5½	.16	.52
4	6	.21	.62
5	8	.25	.75

BITTS
Two Head Riding



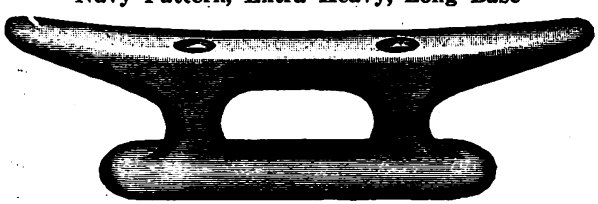
Height, in.	7	8½	10
Length arms, in.	6½	8	10
Size base, in.	4½x6	5x6	5½x8½
Galv., each	$3.00	5.50	7.50
Pol. brass, each	6.00	8.00	10.00

SHIP CLEATS
Heavy Pattern, Short Base



Length, in.	4	5	6	7	8½	10½	13	15	16 to 40
Plain, each	$0.05	.07	.10	.16	.28	.50	.80	1.16	.06 lb.
Galvanized, each	.07	.09	.12	.20	.33	.60	1.00	1.40	.09 lb.

Navy Pattern, Extra Heavy, Long Base



														Galvanized Pound	Plain Pound
Length on top, in.	18,	22,	24,	26,	30,	32,	36,	42,	48					$0.09	$0.06
Length of base, in.,	11½,	13,	13,	14½,	17,	17,	25,	32,	38					.09	.06

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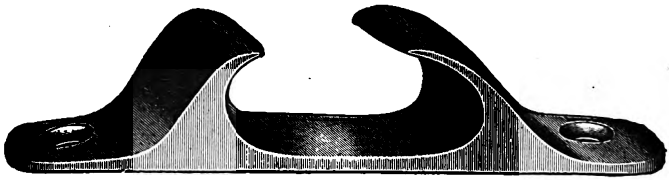
STRAIGHT CHOCKS

Cast Iron and Brass

Open



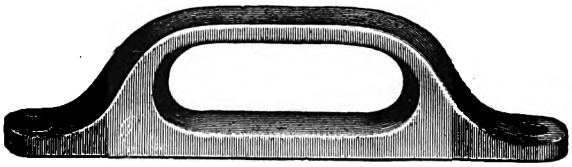
Regular—For Small Boats and Yachts

Size Inches	Galvanized Each	Plain Each	Size Inches	Galvanized Each	Plain Each
3½	$0.06	$0.05	7½	$0.35	$0.32
3¾	.07	.06	8½	.50	.45
4	.08	.07	10½	.60	.50
4½	.10	.08	11½	76	.60
5	.14	.12	13	1.00	.80
5½	.16	.14	14	1.40	1.10
6	.20	.18	15	1.90	1.50
6½	.24	.22			
18, 20, 22, 24, 30	Pound .09	Pound .06			

Light—For Motor Boats

Size Inches	Galvanized Each	Plain Brass Each	Polished Brass Each
3½	$0.06	$0.20	$0.30
4	.08	.30	.40
4½	.10	.40	.55
5	.14	.50	.70
6	.20	65	.90
7	..	.90	1.25
8	..	1.50	2.00
10	..	2.50	3.00

Closed



Length Inches	Galvanized Each	Plain Each	Plain Brass Each	Polished Brass Each
3½	$0.08	$0.07	$0.30	$0.40
4	.10	.09	.40	.50
4½	.12	.10	.50	.60
5½	.18	.16	.65	.85
6	.24	.22	.70	1.00
6½	.28	.25	.85	1.25
7½	.40	.36	1.25	1.75
8	.60	.50	2.00	2.50
10	.70	.60	3.00	3.50
12	1.00	.80	...	...
13	1.30	1.10	...	...
15	1.80	1.60	...	...
18, 20, 22, 24	Pound .09	Pound .06	...	...

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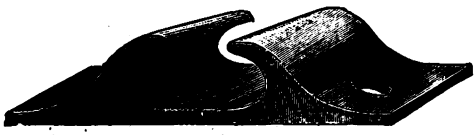
BOW CHOCKS

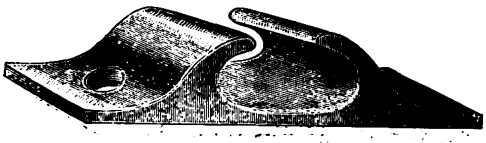
Cast Iron

Regular—For Small Boats and Yachts



Size Inches	Galvanized Pair	Plain Pair
3	$0.10	.08
4½	.12	.10
5½	.20	.17
6½	.35	.28
8	.60	.50
10½	.90	.75
12	1.50	1.25

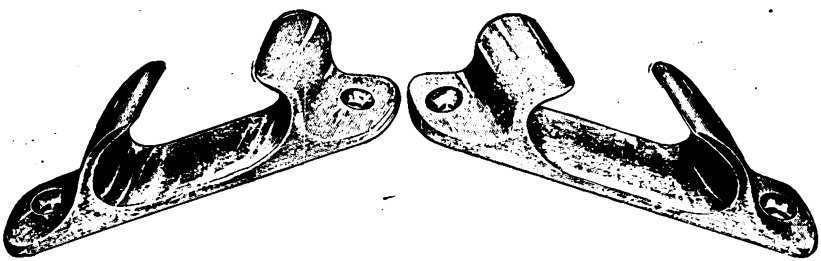
Heavy—For Vessels



Size Inches	Galvanized Pair	Plain Pair
8½	$1.20	$0.90
10½	1.80	1.40
12	2.50	2.00
15	5.00	4.00
	Pound	Pound
18, 20, 24, 30	.12	.09

Light Pattern for Motor Boats

Galvanized Iron and Brass



Length Inches	Width Inches	Opening for Rope Inches	Galvanized Pair	Plain Brass Pair	Polished Brass Pair
3	11/16	⅝	$0.10	$0.30	$0.50
4¼	¾	¾	.12	.50	.70
4½	13/16	¾	.12	.60	.85
5	⅞	⅞	.16	.80	1.15
5½	1	1	.20	1.00	1.50
6½	1⅛	1⅛	.35	1.50	2.00
8	1¼	1¼	...	2.25	3.00
9	1½	1⅜	...	3.00	4.00
10½	1¾	1½	...	3.50	5.00
12	2¼	1⅝	...	5.50	7.00

Measure center of base from end to end

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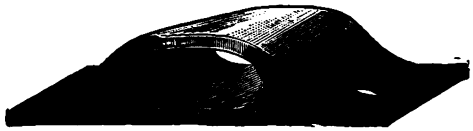
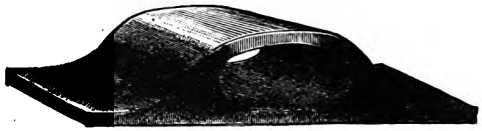
CHOCKS

CLOSED BOW CHOCKS

Galvanized Cast Iron and Brass



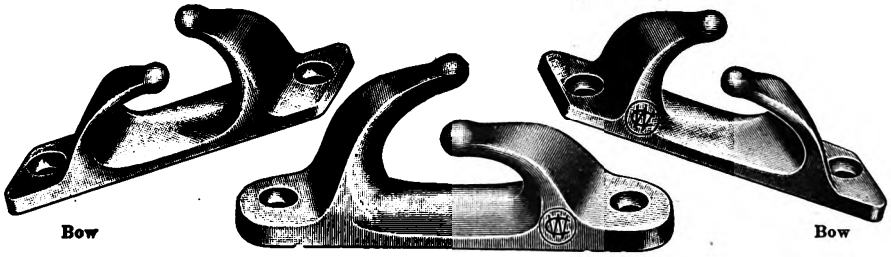


Length Inches	Galvanized Pair	Plain Brass Pair	Pol. Brass Pair
4½	$0.20	$1.15	$1.40
5½	.30	1.50	2.00
6½	.55	2.00	2.50
8	1.00	2.75	3.50
10½	1.50	4.50	6.00

SKENE CHOCKS

Simple, convenient, efficient. Rope cannot come out accidentally

Galvanized Iron and Brass



Bow

Stern

Bow

Bow Pattern

No.	Length Inches	Opening for Rope Inches	Galvanized Iron Per Pair	Polished Brass Per Pair
1	4½	¾	$0.30	$1.00
2	5½	1	.50	1.70
3	7¾	1¼	1.00	3.30
4	8½	1½	1.20	4.30
5	10½	2	2.00	6.80

Stern Pattern

No.	Length Inches	Opening for Rope Inches	Galvanized Iron Each	Polished Brass Each
11	4	⅝	$0.18	$0.50
12	5½	1	.35	1.00
13	7	1½	.60	3.70
14	9	2	1.00	6.70

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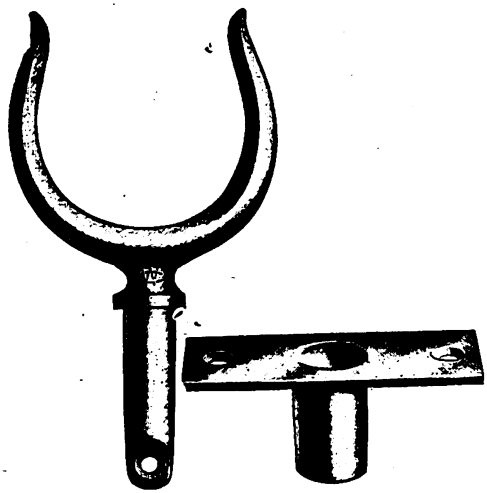
ROWLOCKS

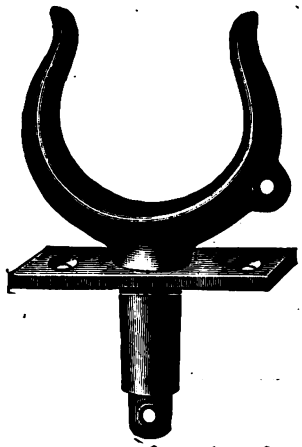
Galvanized Iron and Brass

Drop Forged with Socket



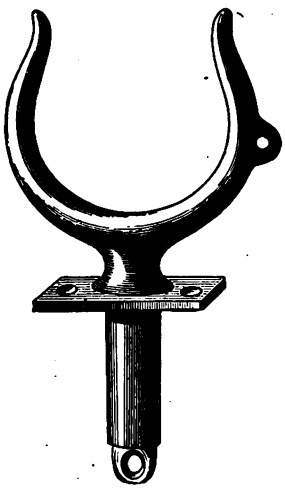
Size, Nos.	1	2	3
Between horns, in.	2	2¼	2½
Galvanized, per pair	$0.35	.50	.65
Horns only	.25	.35	.45

Ribbed Socket



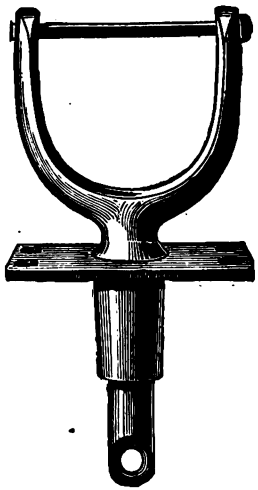
Size, Nos.	0	1	2	3	4
Between horns, in.	1¾	2	2¼	2⅝	3
Galvanized, pair	$0.25	.30	.40	.60	.80
Plain brass, pair	.70	.80	1.30	1.80	2.30

Standard Socket



Size, Nos.	0	1	1½	2	3	4
Between horns, in.	1¾	2	2⅛	2¼	2½	3
Galv., pair	$0.30	.35	.45	.50	.65	.90
Pol. brass, pair	1.25	1.40	1.60	2.00	2.60	3.25

North River



Size between horns, in.	2
Regular socket, galv., per pair	$0.40
Regular socket, pol. brass, per pair	1.75
Side plate socket, galv., per pair	.50
Side plate socket, pol. brass, per pair	2.00

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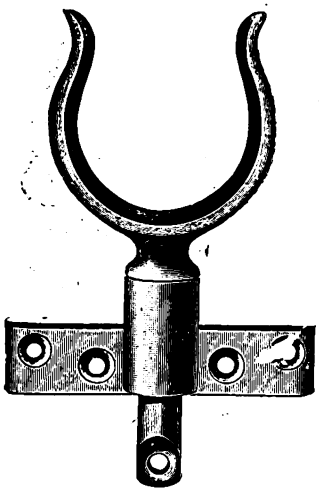
ROWLOCKS

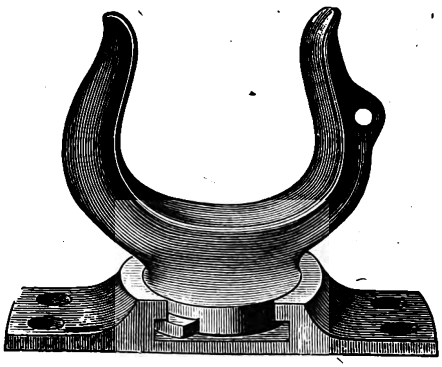
Galvanized Iron and Brass

Standard Side Plate



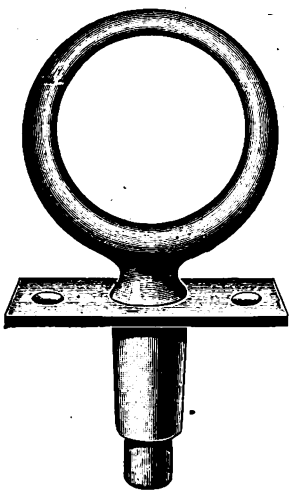
Size, Nos.	00	0	1
Between horns, in.	1½	1¾	2
Malleable, per pair	$0.35	.40	.50
Pol. brass, per pair	1.25	1.50	2.00

Patent Swivel



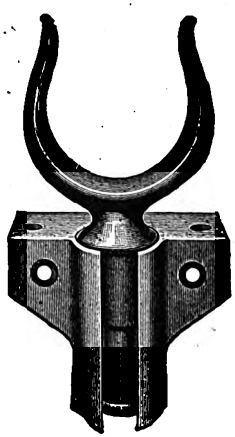
Size, Nos.	0	1	2
Between horns, in.	1¾	2	2¼
Galvanized, per pair	$0.75	.85	1.00
Pol. brass, per pair	2.25	2.40	3.25
Size, Nos.	3	4	5
Between horns, in.	2½	2¾	3
Galvanized, per pair	$1.25	1.50	1.75
Pol. brass, per pair	3.50	3.75	4.00

Round with Socket



Size, Nos.	0	1	2
Diam. hole, in.	2	2¼	2½
Malleable, per pair	$0.35	.40	.50
Pol. brass, per pair	1.40	1.50	2.00

Davis Pattern



Size, No.	0	1	2	3
Between horns, in.	1¾	2	2¼	2½
Malleable, per pair	$0.85	1.00	1.10	1.25
Pol. brass, per pair	2.20	2.50	3.00	3.75

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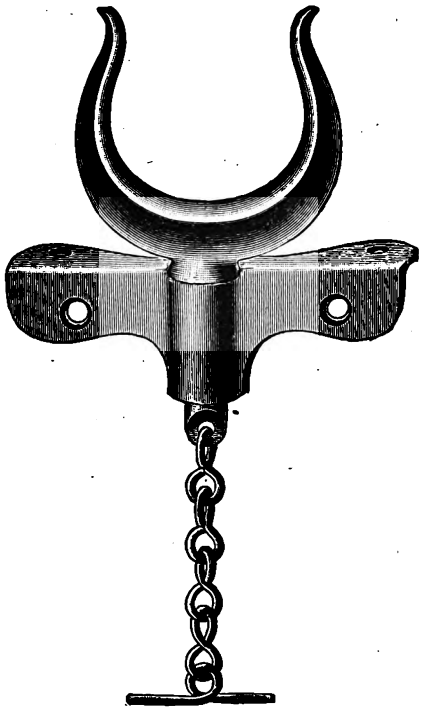
ROWLOCKS

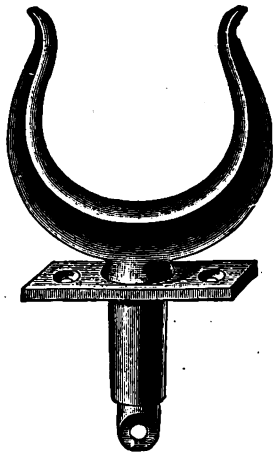
Galvanized Malleable Iron and Brass

Boston Pattern

With Side Plate and Chain



With Socket Only



With Socket Only

Size, No.	0	1	2
Between horns, in.	1¾	2	2¼
Galvanized, per pair	$0.25	.30	.40
Pol. brass, per pair	1.25	1.50	2.00

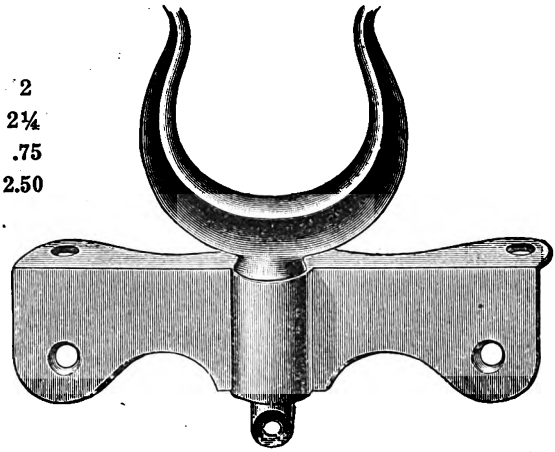
With Side Plate and Chain

Size, Nos.	0	1	2
Between horns, in.	1¾	2	2¼
Galvanized, per pair	$0.50	.60	.75
Pol. brass, per pair	1.75	2.00	2.50

With Extra Long Side Plate Only

Size, Nos.	0	1	2
Between horns, in.	1¾	2	2¼
Galvanized, per pair	$0.50	.60	.75
Pol. brass, per pair	1.75	2.00	2.50

With Side Plate Only



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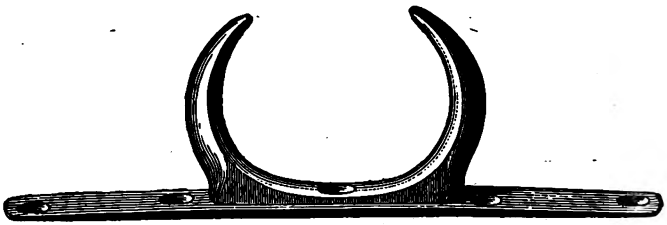
ROWLOCKS

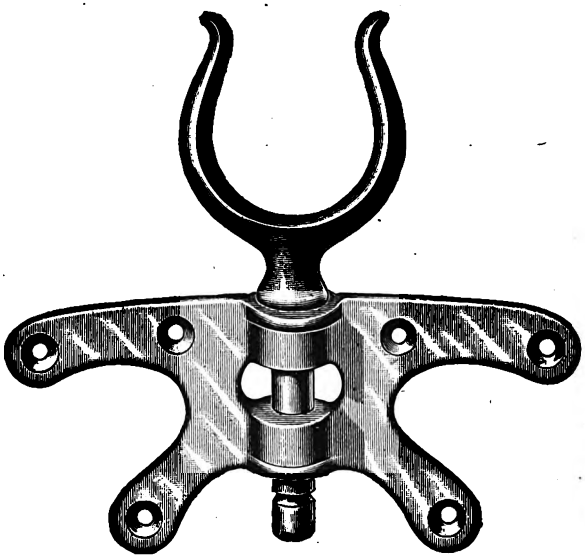
Galvanized Malleable Iron and Brass
Blackburn's



Adapted for Narrow, Light Gunwales

Width of Plate Inch	Length of Plate Inches	Size Between Horns Inches	Galvanized Pair	Polished Brass Pair
1	10½	2¾	$0.75	$2.00

Moline Side Plate



Galvanized iron, 1⅝ in. between horns.....per pair, $0.60

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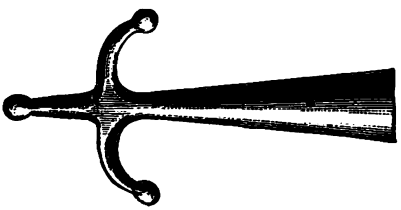
BOAT HOOKS

Galvanized Malleable Iron and Brass

Navy, Ball Points, Single Hook

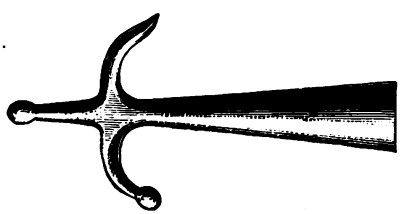
Diam., in.	1	1¼	1½	2
Galvanized, per doz.	$4.60	4.80	5.40	6.00
Plain brass, per doz.	7.00	8.25	10.00	11.75
Pol. brass., per doz.	9.00	10.50	12.00	13.75

Navy, Ball Points, Double Hooks



Diam., in.	1	1¼	1½	2
Galvanized, per doz.	$5.25	5.50	7.00	8.00
Plain brass, per doz.	7.50	9.00	10.50	14.00
Pol. brass, per doz.	9.50	10.75	12.50	16.25

One Ball and One Sharp Point



Diam., in.	1	1¼	1½	2
Galvanized, per doz.	$5.25	5.50	7.00	8.00
Plain brass, per doz.	7.50	9.00	10.50	14.00
Pol. brass, per doz.	9.50	10.75	12.50	16.25

Double hooks can also be furnished with two sharp points.

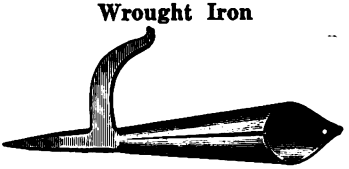
Sharp Points, Single Hook

Diam, in.	1	1¼	1½	2
Galvanized, per doz.	$3.50	3.60	4.80	5.40
Plain brass, per doz.	7.00	8.25	10.00	11.75
Pol. brass, per doz.	9.00	10.50	12.00	13.75

Improved Open Socket

Diam., in.	1	1¼	1½
Length, in.	10	10½	11¼
Galvanized, per doz.	$3.00	3.60	4.80
Plain brass, per doz.	7.00	8.25	10.00
Pol. brass, per doz.	9.00	10.50	12.00
Diam., in.		1¾	2
Length, in.		12	12½
Galvanized, per doz.		$6.00	7.20
Plain brass, per doz.		10.75	11.75
Pol. brass, per doz.		13.00	14.00

Wrought Iron



Diam., in	1	1¼	1½
Black wtih polished points each	$0.80	.90	1.00
Galvanized, each	.90	1.00	1.10
Diam., in.		2	2½
Black with polished points, each		$1.15	$1.25
Galvanized, each		1.25	1.35

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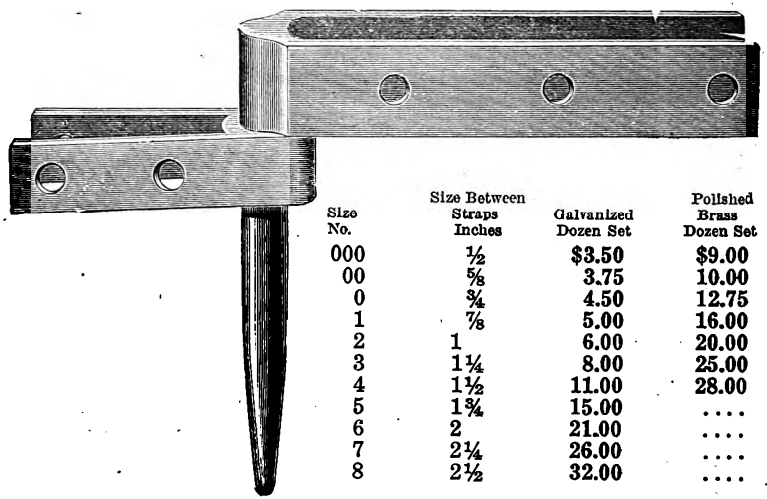
RUDDER BRACES

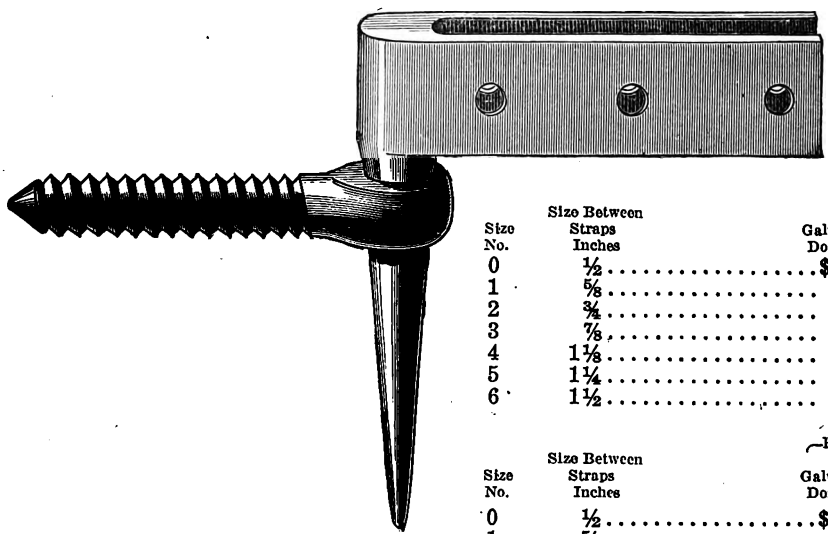
Galvanized Malleable Iron and Brass

With Strap Gudgeons



Size No.	Size Between Straps Inches	Galvanized Dozen Set	Polished Brass Dozen Set	Extra Straps Only — Galvanized Dozen Set	Extra Straps Only — Polished Brass Dozen Set
000	½	$3.50	$9.00	$1.15	$3.00
00	⅝	3.75	10.00	1.25	3.30
0	¾	4.50	12.75	1.50	4.25
1	⅞	5.00	16.00	1.75	5.25
2	1	6.00	20.00	2.00	6.75
3	1¼	8.00	25.00	2.65	8.50
4	1½	11.00	28.00	....	....
5	1¾	15.00	....	....	....
6	2	21.00	....	....	....
7	2¼	26.00	....	....	....
8	2½	32.00	....	....	....

With Screw Gudgeons



Size No.	Size Between Straps Inches	Galvanized Dozen Set	Polished Brass Dozen Set
0	½	$3.00	$7.50
1	⅝	3.25	9.00
2	¾	3.80	11.00
3	⅞	4.50	12.50
4	1⅛	5.50	16.00
5	1¼	6.50	20.00
6	1½	8.50	27.00

Size No.	Size Between Straps Inches	Extra Gudgeons Only — Galvanized Dozen Set	Extra Gudgeons Only — Polished Brass Dozen Set
0	½	$0.75	$1.75
1	⅝	.80	2.75
2	¾	.95	4.00
3	⅞	1.10	5.25
4	1⅛	1.25	6.50
5	1¼	1.50	8.00
6	1½	2.00	11.00

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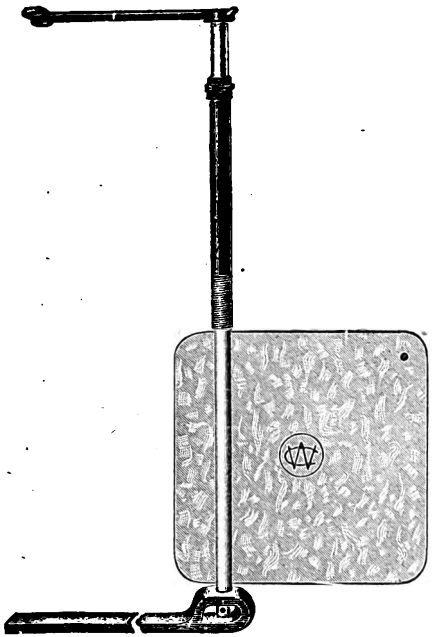
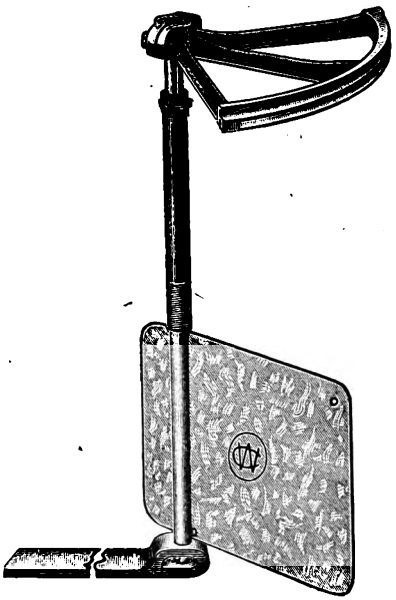
RUDDERS

Galvanized Steel and Brass





Without Tiller or Quadrant

No.	Size Plate Inches	Size Skag Inches	Length Rudder Post Inches	Length Pipe Inches	Galvanized Each	Plain Brass Each
1	14x14x⅛	30x1¾x½	36	12	$7.00	$10.75
2	16x16x⅛	42x2 x⅝	38	15	9.00	13.50
3	17x17x⅛	42x2 x⅝	44	18	10.00	15.50

Complete with Tiller

No.	Size Plate Inches	Size Skag Inches	Length Rudder Post Inches	Length Pipe Inches	Length Tiller Inches	Galvanized Each	Plain Brass Each
11	14x14x⅛	30x1¾x½	36	12	10	$7.75	$11.60
12	16x16x⅛	42x2 x⅝	38	15	12	9.90	14.75
13	17x17x⅛	42x2 x⅝	44	18	15	11.00	17.50

Complete with Quadrant

No.	Size Plate Inches	Size Skag Inches	Length Rudder Post Inches	Length Pipe Inches	Radius Quadrant Inches	Galvanized Each	Plain Brass Each
110	14x14x⅛	30x1¾x½	36	12	10	$9.00	$13.50
120	16x16x⅛	42x2 x⅝	38	15	12	11.50	18.25
130	17x17x⅛	42x2 x⅝	44	18	15	13.00	19.50

Length of rudder post and pipe may be changed on order at small additional expense.

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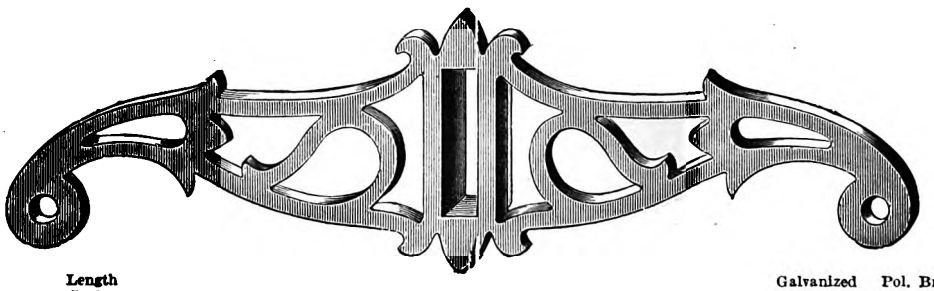
RUDDER YOKES, TILLER QUADRANTS, ETC.

RUDDER YOKES

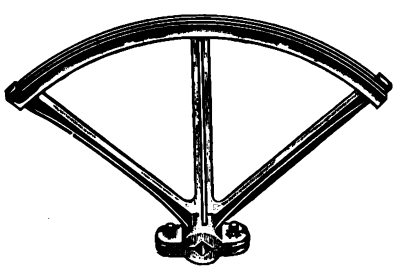
Galvanized Steel and Brass



Size No.	Length Inches	Galvanized Each	Pol. Brass Each
1	12	$0.50	$1.40
2	14	.60	1.50
3	16	.80	1.85
4	18	1.00	2.20
5	20	1.25	2.50

TILLER QUADRANTS

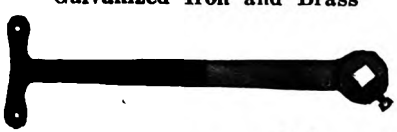
Galvanized Iron and Brass



Radius Inches	Size of Square Hole Adjustable Inches	Malleable Each	Plain Brass Each	Polished Brass Each
7	9/16 to ¾	....	$2.00	$3.00
10	9/16 to 1	$2.00	4.00	5.00
12	¾ to 1¼	2.50	5.00	6.00
15	⅞ to 1¼	3.50	6.00	7.50
18	1 to 1⅜	5.00	8.00	10.00
24	1¼ to 1¾	12.50	...	....

STRAIGHT TILLERS

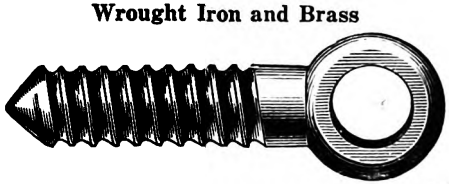
Galvanized Iron and Brass



Length Inches	Size of Hole Inches	Malleable Each	Plain Brass Each	Polished Brass Each
10	9/16 x 9/16	$0.75	$1.25	$1.75
12	¾ x ¾	.90	1.50	2.00
15	⅞ x ⅞	1.10	2.00	2.50

RUDDER GUDGEONS

Wrought Iron and Brass



Diam. iron, in.	⅝
Length under head, in.	2½
Diam. hole, in.	⅝
Galvanized, per doz.	$2.25
Plain brass, per doz.	3.00
Polished brass, per doz.	4.25

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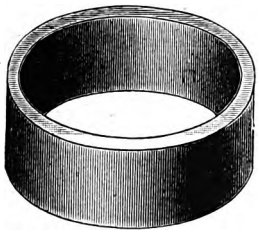
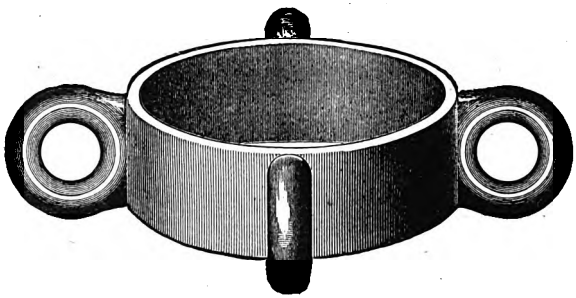
MAST BANDS AND PLATES

MAST BANDS OR WITHES

Galvanized Norway Iron. Drop Forged



Plain

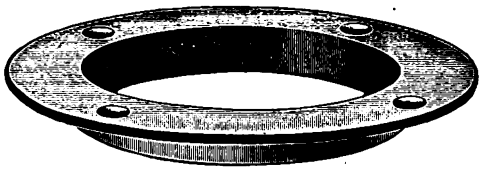


Four Eyes

Inside Diameter Inches	Without Eyes Each	One Eye Each	Two Eyes Each	Three Eyes Each	Four Eyes Each
1¼	$0.40	$0.60	$0.85	$1.00	$1.35
1½	.45	.60	.85	1.00	1.35
1¾	.45	.65	.90	1.10	1.40
2	.50	.65	.90	1.10	1.40
2½	.55	.70	.95	1.15	1.45
2¾	..	.70	.95	1.15	1.45
3	.60	.75	1.00	1.20	1.50
3½	.65	.80	1.10	1.30	1.55
3¾	...	.85	1.15	1.35	1.60
4	.70	.90	1.20	1.40	1.75
4½	.75	1.05	1.30	1.50	1.75
5	.80	1.15	1.40	1.65	1.85
5½	..	1.30	1.50	1.75	2.00
6	.85	1.40	1.65	1.85	2.10
7	.90	3.90	5.40	7.00	8.50
8	1.10	4.10	5.80	7.20	9.00

MAST PLATES

Polished Brass



Size No.	Diameter of Opening Inches	Diameter of Flange Inches	Each	Size No.	Diameter of Opening Inches	Diameter of Flange Inches	Each
1	1	2	$0.25	8	2¾	4½	$0.42
2	1¼	2¼	.28	9	3	4¾	.45
3	1½	2½	.28	10	3½	5¼	.60
4	1¾	3	.30	11	4	5⅞	.85
5	2	3⅜	.30	12	4½	6¼	.95
6	2¼	3½	.35	13	5	6⅞	1.00
7	2½	3½	.38	14	6	8⅜	1.20

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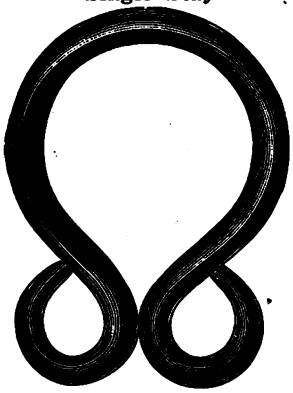
JIB HANKS, RINGS, ETC.

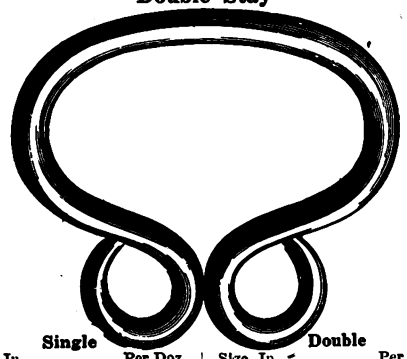
JIB HANKS

Galvanized Wrought Iron

Single Stay



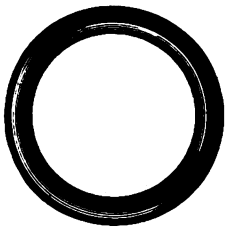
Double Stay



Single Size, In.	Per Doz.	Double Size, In.	Per Doz.
¾	$0.55	1½	$0.85
⅞	.60	1¾	.90
1	.65	2	1.00
1¼	.70	2¼	1.10
1½	.75	2½	1.30
1¾	.80	2¾	1.45
2	.90	3	1.65
2¼	1.00	3¼	2.00
2½	1.15	3½	2.50
2¾	1.30	3¾	2.85
3	1.50	4	3.30
3¼	1.75	4¼	3.60
3½	2.25	4½	3.85
3¾	2.70	4¾	4.00
4	3.00	5	4.50
4¼	3.25	5¼	4.75
4½	3.50	5½	5.00
4¾	3.75	5¾	5.25
5	4.00	6	5.50
5½	4.50		
6	5.00		

JIB RINGS

Galvanized Wrought Iron



Size, In.	Per Doz.	Size, In.	Per Doz.
5/16x1½	$2.00	7/16x5½	$3.50
5/16x2	2.25	7/16x6	3.50
5/16x2¼	2.25	½x2¾	3.75
5/16x2½	2.25	½x3	3.75
⅜x1½	2.00	½x3¼	3.75
⅜x1¾	2.25	½x3½	3.75
⅜x2	2.25	½x4	3.75
⅜x2¼	2.50	½x5	4.00
⅜x2½	2.50	½x6	4.00
⅜x2¾	2.50	½x6½	4.50
⅜x3	2.50	9/16x3	4.50
⅜x3¼	2.50	9/16x3¼	4.50
⅜x3½	2.50	9/16x3½	4.50
7/16x1½	2.50	9/16x4	4.50
7/16x2	2.75	⅝x3	5.50
7/16x2¾	3.00	⅝x3¼	5.50
7/16x3	3.00	⅝x3½	5.50
7/16x3¼	3.00	⅝x4	5.50
7/16x3½	3.00	⅝x5	5.50
7/16x4	3.00		

BELAYING PINS

Galvanized Malleable Iron and Brass

Diam. shank, in.	1	1	1⅛
Length head, in.	5	6½	7
Entire length, in.	12	15	16
Galvanized, doz.	$5.00	6.00	9.00
Plain brass, doz.	12.00	15.00	18.00
Polished brass, doz.	18.00	21.00	24.00

Diam. shank, in.	1¼	1½
Length head, in.	8	9
Entire length, in.	19	22
Galvanized, doz.	$11.00	18.00
Plain brass, doz.	24.00	....
Polished brass, doz.	30.00	....

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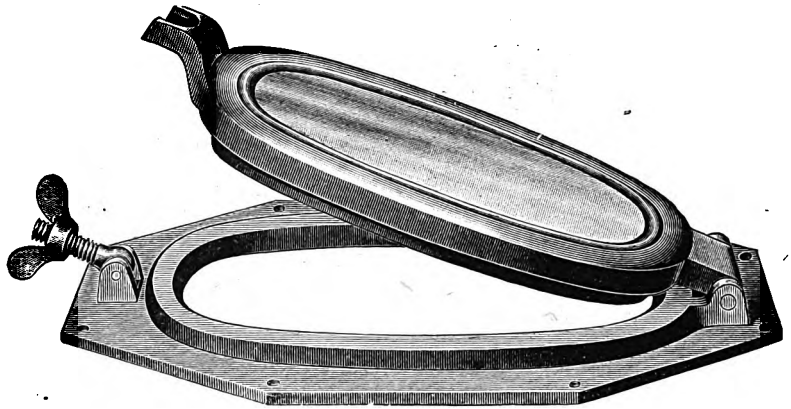
OVAL SIDE OR PORT LIGHTS

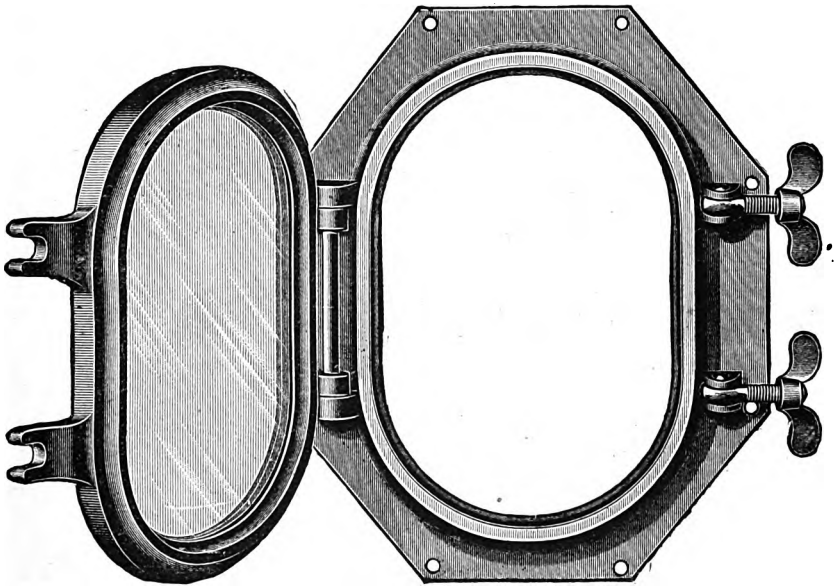
Horizontal Pattern, for Wood Hulls



This light is designed for small yachts where the low cabin will not permit the use of a circular light.

Size of opening 4x7 in.....Plain brass, each, $4.00; Polished brass, each, $6.00
Size of opening 5x9 in.....Plain brass, each, 6.00; Polished brass, each, 8.00

Vertical Pattern, with Two Thumb Screws



Size of opening 5x 8 in.....Plain brass, each, $6.00; Polished brass, each, $8.00
Size of opening 5x10 in.....Plain brass, each, 7.00; Polished brass, each, 9.00

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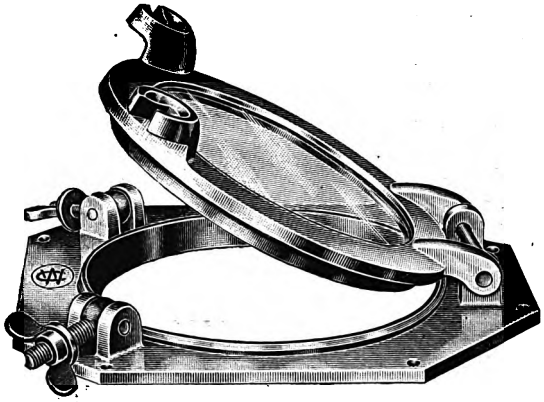
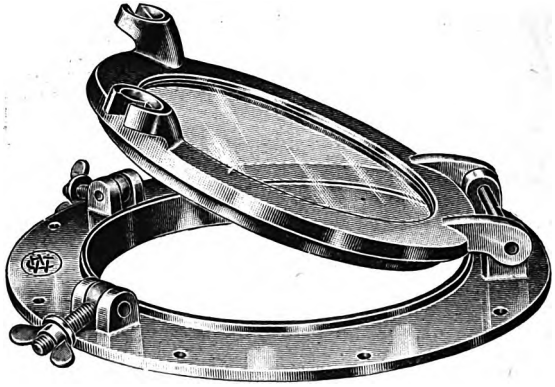
SIDE OR PORT LIGHTS

Octagon Pattern, Two Fastenings, for Wood Hulls



Size Opening Inches	Thickness of Glass Inches	Galvanized Iron Each	Plain Brass Each	Polished Brass Each
10	½	$14.00	$17.00	$20.00
11	½	16.00	22.00	27.00
12	½	20.00	27.00	32.00
14	¾	....	32.00	38.00

Round Pattern, Two Fastenings, for Wood Hulls



Size Opening Inches	Thickness of Glass Inches	Galvanized Iron Each	Plain Brass Each	Polished Brass Each
10	½	$14.00	$17.00	$20.00
11	½	16.00	22.00	27.00
12	½	20.00	27.00	32.00

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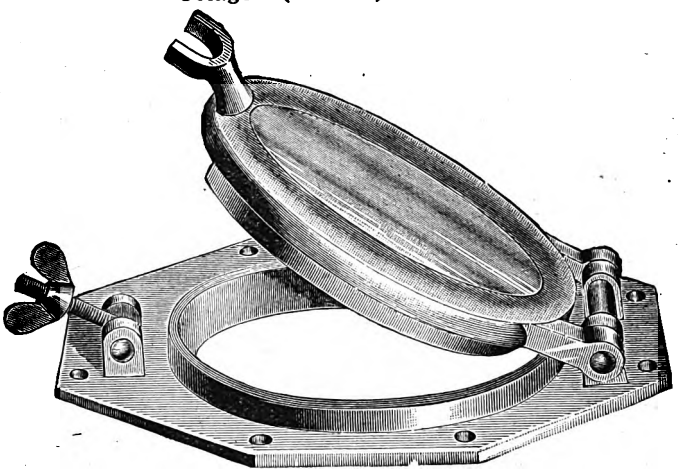
SIDE OR PORT LIGHTS

Octagon (Monitor) Pattern



Size of opening, in.....	3	4	5	6	7	8	9	10
Thickness of glass, in.....	¼	¼	⅜	⅜	½	½	½	½
Galvanized iron, each.....	$2.25	2.50	2.75	3.90	4.75	5.75	8.00	10.00
Plain brass, each.....	2.75	3.00	3.25	4.40	5.50	6.50	9.00	12.00
Polished brass, each.....	4.25	4.50	4.80	6.00	7.25	8.25	11.50	15.00

Round Pattern

Size of opening, in.....	3	4	5	6	7	8	9	10
Thickness of glass, in.....	¼	¼	⅜	⅜	½	½	½	½
Galvanized iron, each.....	$2.25	2.50	2.75	3.90	4.75	5.75	8.00	10.00
Plain brass, each.....	2.75	3.00	3.25	4.40	5.50	6.50	9.00	12.00
Polished brass, each.....	4.25	4.50	4.80	6.00	7.25	8.25	11.50	15.00

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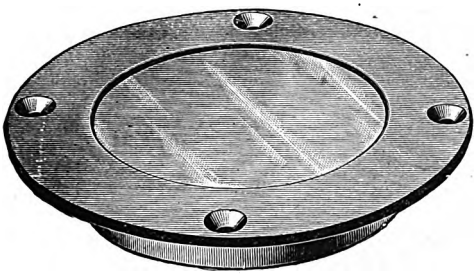
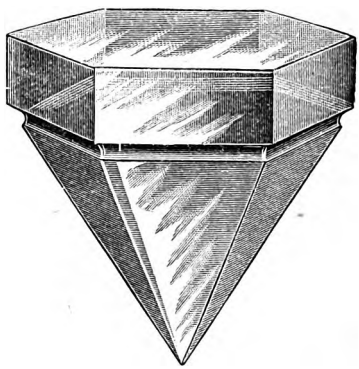
DECK LIGHTS

Round Brass Frame, Glass Inserted



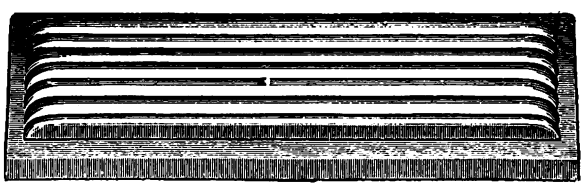
Size Glass Inches	Plain Each	Polished Each
2½	$0.65	$0.75
3½	.90	1.00
4	1.40	1.50
5	1.85	2.00
6	2.35	2.50
7	2.85	3.00
8	3.35	3.50
9	3.80	4.00
10	4.80	5.00

Hexagon Glass



Nos.	1	2
Diam. face, in.	3	4
Per dozen	$4.00	8.00

Ribbed Glass



Nos.	1	2	3	4	5
Size, in.	6x3	9½x2½	10x3	10½x3½	12x4
Each	$0.50	.60	.75	1.00	1.25

Plain glass deck lights, round or square, furnished to order.

Port Light Glasses

Finest plate glass discs with ground edges.

Thick. Inch	Diameter, Inches							
¼	2½	3½	...	...	...	..	..	..
⅜	2½	3	3¾	4½	5½	..	..	..
½	5 5/16	6¼	6½	7 7/16	8½	9	10	11
⅝	5	...	...	...	...	..	..	..

Thick. Inch	Diameter, Inches					
11/16	6	...	...	...	...	....
¾	6¾	7⅛	7¾	8½	9¾	10⅝
13/16	11 3/16	...	...	...	...	....
⅞	8⅞	...	...	...	...	....

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VENTILATORS, DECK PLATES AND DECK PIPES

HOOD VENTILATORS

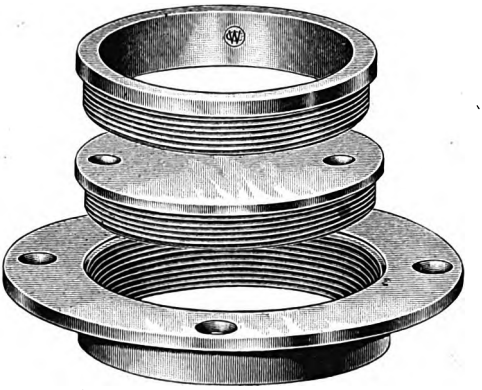
Brass and Galvanized

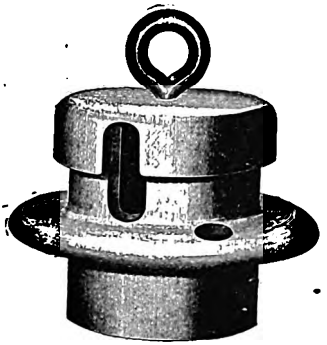
Size Plate Inches	Diameter Mouth, Inches	Height Inches	Galvanized Each	Pol. Brass Each
3	6	9	$4.70	$7.20
3½	7	10	5.50	8.00
4	8	11	5.95	8.45
4½	9	12	8.65	11.15
5	10	14	9.85	12.50
6	12	15	12.25	15.50
7	14	18	16.55	20.00
8	16	21	20.00	23.50

VENTILATOR DECK PLATES

With Ring for Hood Ventilator and Key

Diameter Opening Inches	Polished Each
3	$3.00
3½	3.50
4	3.75
4½	4.00
5	5.50
6	7.50





CHAIN DECK PIPES

Diameter Inches	For Chain Inches	Galvanized Each	Plain Brass Each	Pol. Brass Each
1¾	3/16	$0.50	$1.50	$2.00
2	¼	.65	2.00	3.00
2¼	5/16	.70	3.50	5.00
2½	⅜	.75	4.00	6.00
3	½	1.00	5.00	7.00
3½	⅝	1.50	7.00	10.00
4	¾	2.50	...	...
4½	⅞	3.00	...	...
5	1	3.25	...	...
5½	1⅛	4.00	...	...
6	1¼	4.25	...	...

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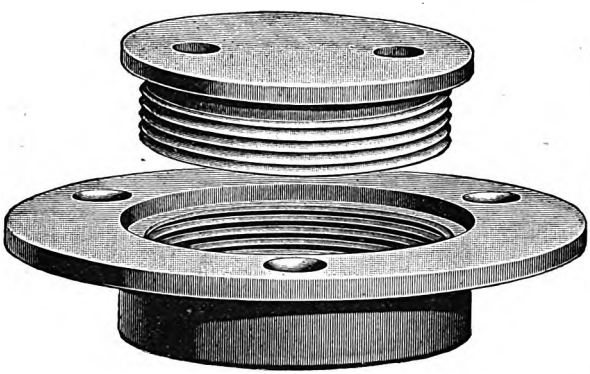
DECK PLATES

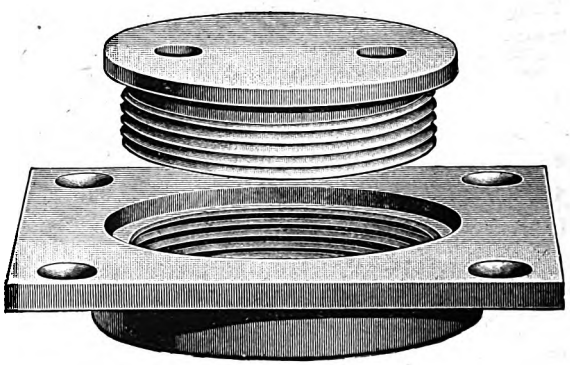


ROUND

Size Opening, In.	Each
1	$0.70
1¼	.80
1½	.90
1¾	1.00
2	1.20
2¼	1.40
2½	1.60
2¾	1.90
3	2.20
3½	2.80
4	3.00
4½	3.20
5	4.40
6	6.00
7	8.00
8	9.60

SQUARE

Size Opening, In.	Each
1	$0.70
1¼	.80
1½	.90
1¾	1.00
2	1.20
2¼	1.40
2½	1.60
2¾	1.90
3	2.20
3½	2.80
4	3.00
4½	3.20
5	4.40
6	6.00
7	8.00
8	9.60



FLOOR BULLSEYE OR DECK PLATE FOR PAINTER

Size No.	Opening Inches	Diameter Flange Inches	Galvanized Each	Polished Brass Each
1	¾	2	$0.10	$0.25
2	1	2⅜	.12	.28
3	1⅜	2⅞	.15	.35
3½	1½	3	.16	.37
4	1¾	3¼	.18	.40
5	2	3⅞	.20	.45
6	2½	4½	.25	.50
7	3	4⅞	.30	.60
8	3¾	5⅝	.35	.75
9	4 1/16	5⅞	.40	.90

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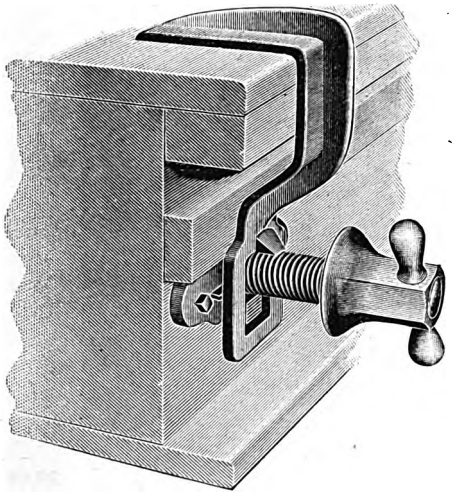
THE MULLHOLLAND HATCH FASTENERS



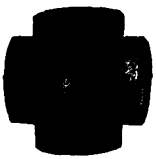
The latest improved fastener for holding tarpaulins and covers firmly on the coaming and used almost exclusively on the Great Lakes.

Prices on application.

RAILING FITTINGS

GALVANIZED MALLEABLE IRON AND POLISHED BRASS RAILING FITTINGS

Iron Pipe Thread



Cross

Cross, Side Outlet

Acorn Ornament

Floor Flange

Elbow

Elbow, Side Outlet

Tee

Tee, Side Outlet

Size, inches	Galv. ½	Br.	Galv. ¾	Br.	Galv. 1	Br.	Galv. 1¼	Br.	Galv. 1½	Br.	Galv. 2	Br
Elbow	$0.15	.60	.18	.70	.20	.80	.35	1.20	.45	1.60	.72	2.50
Side outlet elbow	.20	.80	.23	.90	.25	1.10	.40	1.70	.50	2.00	.80	3.00
Tee	.20	.80	.23	.90	.25	1.10	.40	1.70	.50	2.00	.75	3.00
Side outlet Tee	.30	1.20	.33	1.30	.35	1.50	.45	2.00	.55	2.40	.90	3.50
Cross	.30	1.20	.33	1.30	.35	1.50	.45	2.00	.58	2.40	1.10	3.50
Side outlet cross	.35	1.40	.38	1.50	.40	1.70	.50	2.25	.65	3.00	1.35	4.00
Floor flange	.14	.30	.15	.40	.15	.55	.20	.75	.28	1.00	.30	1.30
Ornament	.16	1.00	.18	1.50	.20	2.00	.25	2.50	.35	3.25	.90	4.50

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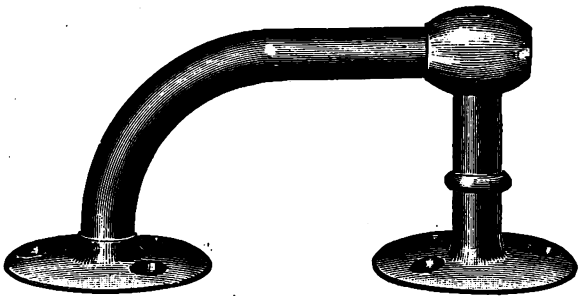
RAILING FITTINGS

RAIL ENDS

Galvanized Iron and Polished Brass
With Plate and One Stanchion Post

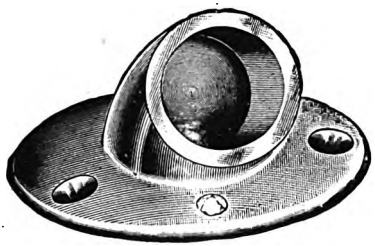


Size No.	To go with Stanchion Post Inches	Diameter of Rail Inch	Galvanized Each	Polished Brass Each
1	2	½ or ⅝	$0.40	$0.75
2	2½	½ or ⅝	.65	1.00
3	3	½ or ⅝	.80	1.25
4	3½	⅝ or ¾	1.00	1.50

Bored for pipe rails to order, viz.: Nos. 1, 2, 3 for ¼ in. pipe; Nos. 3 and 4 for ⅜ in. pipe; No. 4 for ½ in. pipe.

RAIL ENDS

Galvanized Iron and Polished Brass

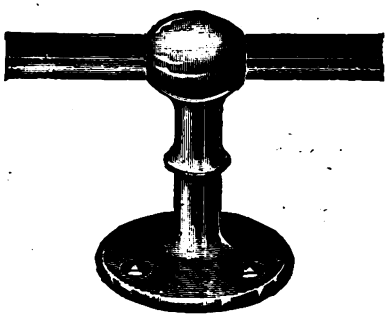


Size No.	Bored for Rail Inch	Galvanized Each	Polished Brass Each
01	½	$0.20	$0.25
02	⅝	.25	.35
03	¾	.50	.70

Bored for pipe rails to order, viz.: No. 01 for ¼ in. pipe; No. 02 for ⅜ in. pipe; No. 03 for ½ in. pipe.

HAND RAILS

Polished Brass



	Per Foot
½ in. tubing, outside diameter	$0.35
⅝ in. tubing, outside diameter	.45
¾ in. tubing, outside diameter	.50
⅞ in. tubing, outside diameter	.60

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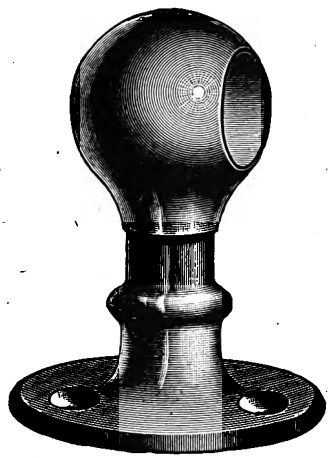
STANCHION POSTS

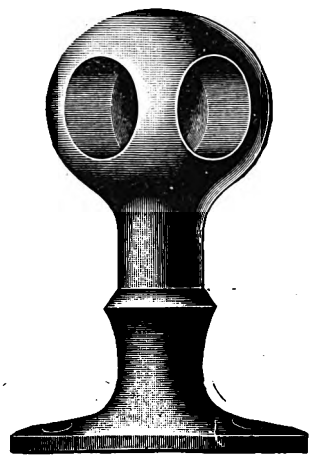
Galvanized Iron and Polished Brass

End



Furnished for end, center, bow or corner. Always specifiy which pattern is wanted.

Bow



Size No.	Extreme Height of Post Inches	Bored for Rail Inch	Center or End — Galvanized Each	Center or End — Brass Each	Bow or Corner — Galvanized Each	Bow or Corner — Brass Each
1	2	½	$0.15	$0.25	$0.25	$0.40
1½	2	⅝	.15	.25	.25	.40
2	2½	½	.20	.35	.30	.45
2½	2½	⅝	.20	.35	.30	.45
3	3	½	.30	.50	.40	.60
3½	3	⅝	.30	.50	.40	.60
4	3½	⅝	.40	.65	.50	.75
4½	3½	¾	.40	.65	.50	.75
5	4	⅝	.50	.80	.60	.90
5½	4	¾	.50	.80	.60	.90
6	4½	⅝	.65	1.00	.75	1.10
6½	4½	¾	.65	1.00	.75	1.10
7	5	¾	.80	1.25	.90	1.35
7½	5	⅞	.80	1.25	.90	1.35
8	5½	¾	1.00	1.50	1.10	1.60
8½	5½	⅞	1.00	1.50	1.10	1.60
9	6	¾	1.25	2.00	1.40	2.15
9½	6	⅞	1.25	2.00	1.40	2.15
10	8	⅞	2.00	3.00	2.25	3.25
10½	8	1	2.00	3.00	2.25	3:25

Light Pattern Posts Nos. 1 to 4½ made in brass only. Use above list. Posts will be bored for pipe rails to order, viz., Nos. 1, 2, 3 for ¼ in. pipe; Nos. 3, 4, 5 for ⅜ in. pipe; No. 5 and larger for ½ in. pipe.

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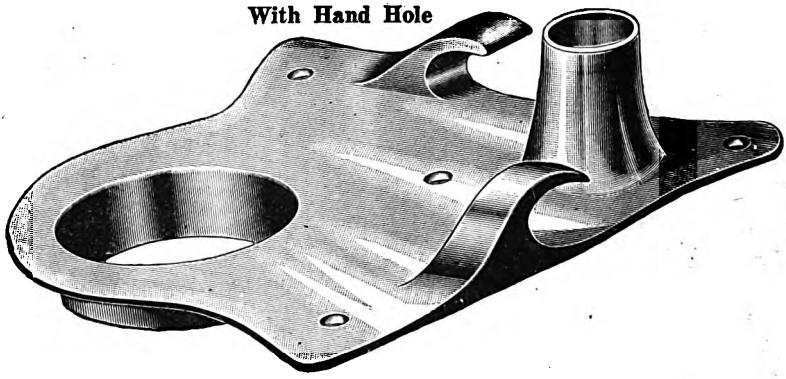
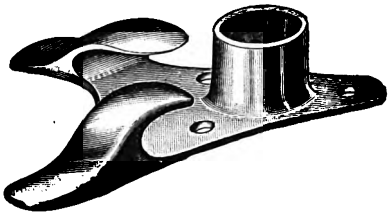
COMBINATION BOW PLATES

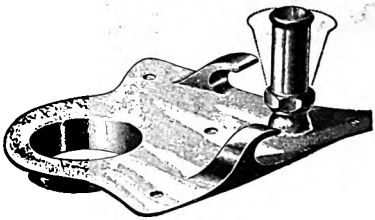
With Hand Hole



Without Hand Hole



Adjustable Flagpole Socket



With Hand Hole

Size No.	Size of Plate Inches	Diameter of Flagpole Inches	Diameter of Hand Hole Inches	Galvanized Each	Plain Brass Each	Polished Brass Each
1	11x6	1	4	$2.00	$2.25	$3.00
2	11x6	1¼	4	2.25	2.50	3.25
3	11x6	1½	4	2.50	2.75	3.50

Without Hand Hole

Size No.	Size of Plate Inches	Diameter of Flagpole Inches	Galvanized Each	Plain Brass Each	Polished Brass Each
4	7½x6	1	$1.50	$2.00	$2.50
5	7½x6	1¼	1.60	2.25	2.75
6	7½x6	1½	1.70	2.50	3.00

Adjustable Flagpole Socket

No. 1 For 1 inch. diameter flagpole, polished brass, each.....$3.50
No. 2 For 1¼ inch diameter flagpole, polished brass, each..... 3.75
No. 3 For 1½ inch diameter flagpole, polished brass, each..... 4.00

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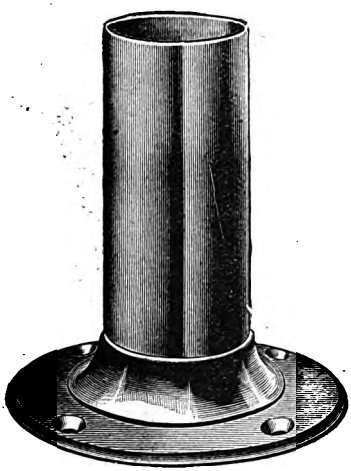
FLAGPOLE SOCKETS

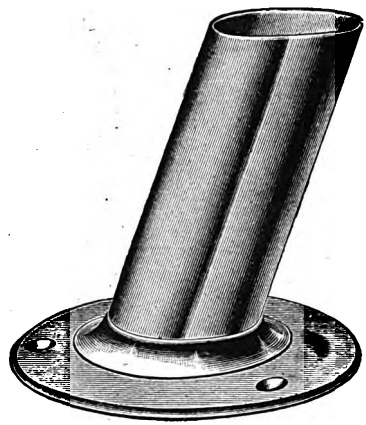
ROUND BASE FLAGPOLE SOCKETS

Bow



Light
Upright

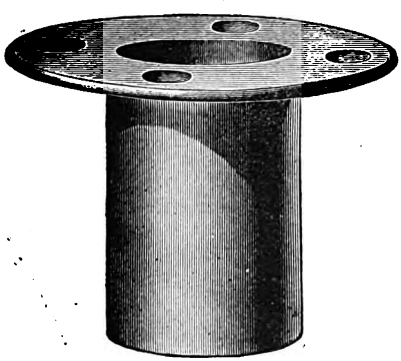
Stern



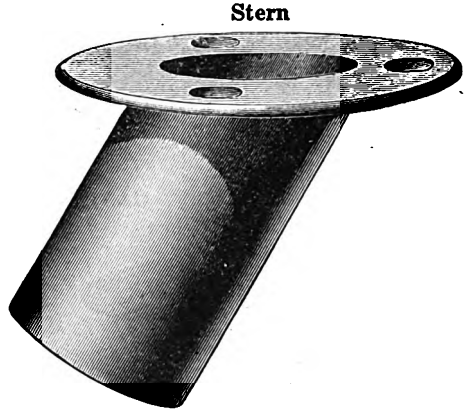
Inside Diameter Inches	Height Inches	Diameter of Base Inches	Polished Brass Bow Each	Polished Brass Stern Each
1	2½	3	$0.75	$1.00
1¼	3	3⅜	.85	1.10
1½	3½	3½	1.00	1.25

FLUSH FLAGPOLE SOCKETS

Bow



Stern



Inside Diameter Inches	Depth Inches	Diameter of Flange Inches	Galvanized Bow Each	Galvanized Stern Each	Plain Brass Bow Each	Plain Brass Stern Each	Polished Brass Bow Each	Polished Brass Stern Each
¾	1⅝	2	$0.20	$0.30	$0.35	$0.45	$0.40	$0.50
1	1¾	2½	.25	.35	.40	.50	.50	.60
1¼	2	2⅝	.35	.45	.50	.60	.60	.70
1½	2⅜	3⅛	.45	.55	.60	.75	.80	.90
1¾	3	3⅜	.55	.70	.80	.90	1.00	1.10
2	3⅞	3⅞	.75	.90	1.00	1.10	1.25	1.35

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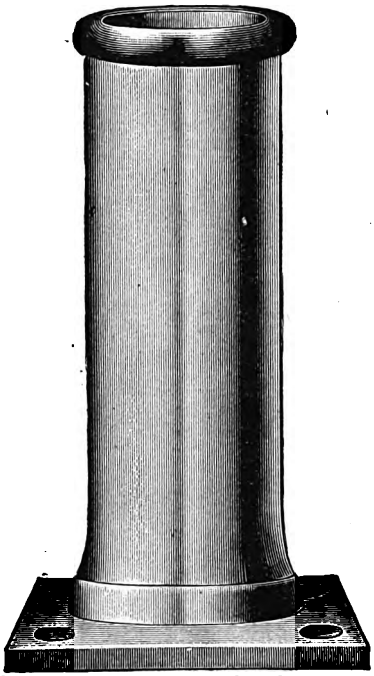
FLAGPOLE SOCKETS

SQUARE BASE FLAGPOLE SOCKETS

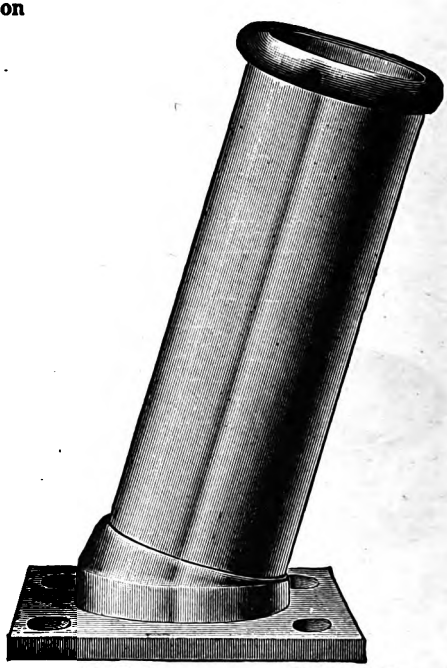
Bow



Galvanized Iron and Brass

Heavy Upright

Stern



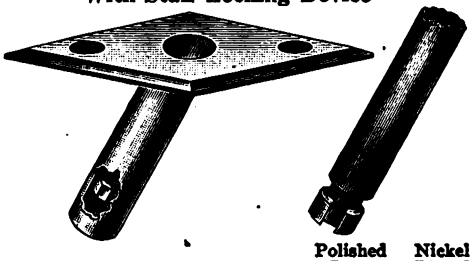
Inside Diameter Inches	Height Inches	Size of Base Inches	Galvanized Bow Each	Galvanized Stern Each	Polished Brass Bow Each	Polished Brass Stern Each
¾	2¼	2 x2	$0.20	$0.25	$0.55	$0.75
1	3½	2⅝x2⅝	.35	.40	.75	1.00
1¼	4	2⅞x2⅞	.45	.50	.85	1.10
1½	5	3¼x3¼	.55	.65	1.00	1.25
1¾	5½	3¼x3¼	.80	.90	1.50	1.75
2	6	3¾x3¾	1.00	1.25	2.00	2.25

CANOE FLAGPOLE SOCKETS

Flush Pattern

Diameter hole, in.	¾
Polished brass ..... each,	$0.50
Nickel plated ..... each,	.65

With Staff Locking Device



	Polished Brass	Nickel Plated
For ¼ in. metal staff..... each,	$0.40	.50
For ½ in. wooden staff ..... each,	.50	.60

Flagstaff for Above Socket

Polished brass, 18 in. ..... each,	$0.40
Nickel plated, 18 in. ..... each,	.50

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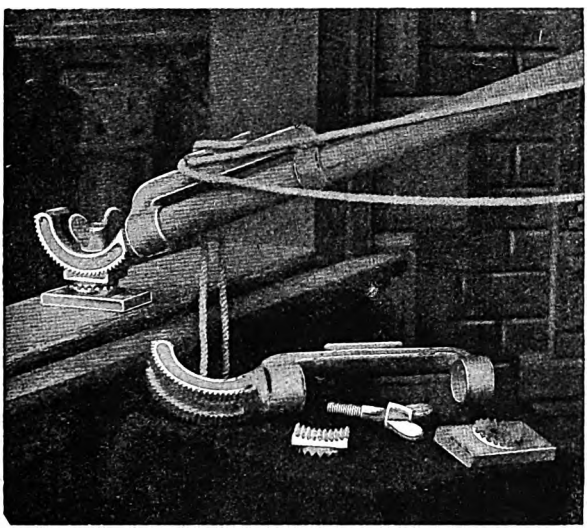
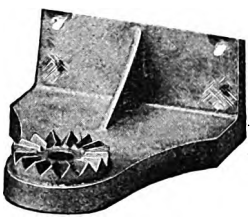
BRACKETS

FLAGSTAFF BRACKETS
"Ineeda"



Base Plate for Brick or Stone

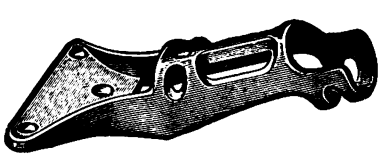


The bracket is furnished regular with base for wood sill. The above special bracket is furnished to order for use on brick or stone sills.

It has fewer parts than any other adjustable bracket. It can be set to nearly four hundred different angles by one thumb screw. It leaves only one small casting on window sill when detached. Every bracket has a cleat for flag halyards.

For pole diameter, in	1¼	1½	1¾	2
Galvanized iron, each	$1.50	2.00	2.50	3.00

STATIONARY BRACKETS
Galvanized Iron



For pole diameter, in	½	⅝	¾	1	1¼	1½	2
Galvanized iron, each	$0.10	.12	.15	.35	.45	.50	1.00

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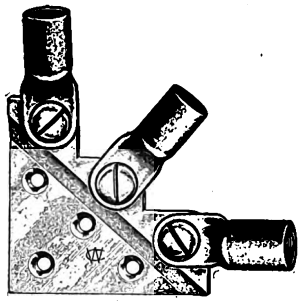
SPRAY HOOD ROD ATTACHMENTS AND SOCKETS

SPRAY HOOD ROD ATTACHMENTS

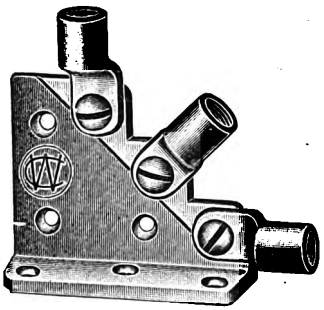
Galvanized Iron and Brass

For Side Attachment



Size, Nos.	1	2
No. of sockets	3	4
Tapped for pipe, in.	¼	¼
Tapped for rod, in.	½	½
Galvanized, per pair	$1.50	2.00
Polished brass, per pair	3.50	4.00

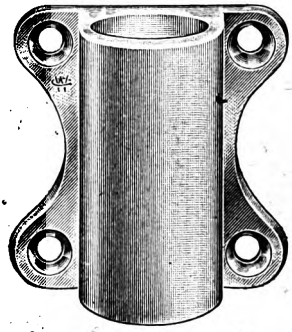
With Deck Flange



Size, Nos.	3	4	5	6
No. of sockets	3	4	3	4
Tapped for pipe, in.	¼	¼	⅜	⅜
Tapped for rod, in.	½	½	⅝	⅝
Galv., per pair	$1.75	2.25	4.00	5.00
Pol. brass, per pair	3.75	4.25	....	....

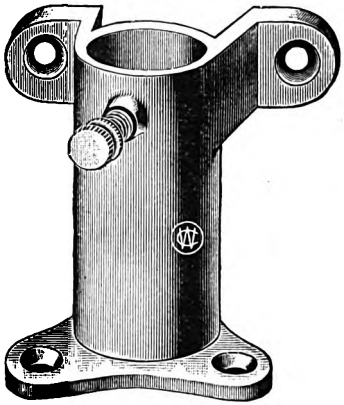
SPRAY HOOD STATIONARY SOCKETS

Galvanized Iron and Brass



Diameter Rod Inches	Galvanized Each	Polished Brass Each
½	$0.25	$0.45
⅝	.30	.50
¾	.35	.55
⅞	.40	.60
1	.45	.70
1⅛	.50	.80
1¼	.55	.90

AWNING SOCKETS FOR LAUNCHES



Size Nos.	1	2
Inside diam. hole, in.	¾	⅞
Will take pipe, in.	⅜	½
Size base, in.	1⅞x1½	1⅞x1½
Galvanized, each	$0.25	.35
Polished brass, each	.50	.60

Size Nos.	3	3½	4
Inside diam. hole, in.	1	1⅛	1¼
Will take pipe, in.	..	¾	...
Size base, in.	2⅛x1⅝	2¼x2	2¼x2
Galvanized, each	$0.45	.55	.60
Polished brass, each	.75	.95	1.00

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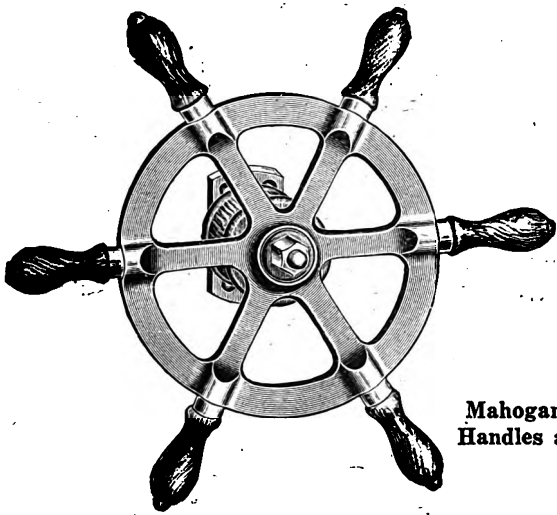
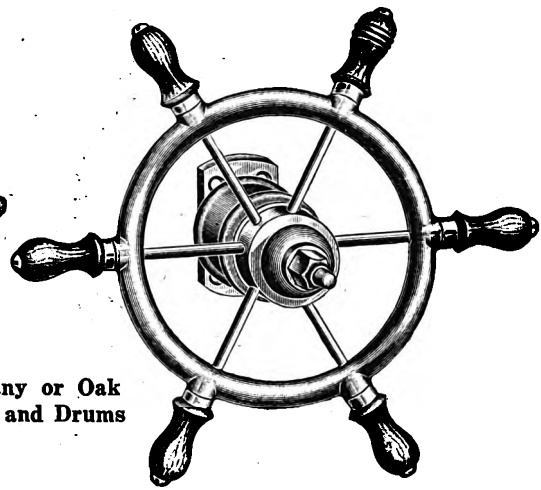
LAUNCH STEERING WHEELS

POLISHED BRASS

Flat Spokes and Rim



Round Spokes and Rim

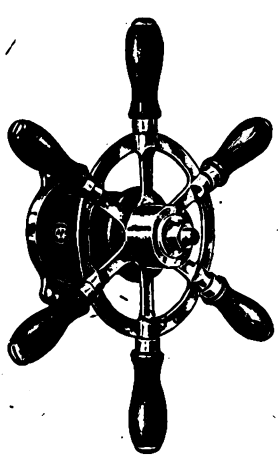


Mahogany or Oak Handles and Drums

Nos.	6	7	8	9
Size wheel, in.	12	16	20	25
Diam. drum, in.	2½	3	4	4
Length drum, in.	3	3½	4½	6
Each	$6.00	7.00	15.00	20.00

Nos.	60	70	80
Size wheel, in.	12	16	20
Diam. drum, in.	2½	3	4
Length drum, in.	3	3½	4½
Each	$7.00	8.00	16.00

With Self Locking Drum



By means of a simple mechanical device on the principle of an expanding brake this wheel is automatically locked in any position in which the steersman may leave it. No amount of strain on the wheel ropes will move the wheel, although it may be turned at will by means of the spokes in the usual way. The back plate is of special design and prevents the wheel ropes from being jammed between the plate and the drum.

Size, inches	12	16
Polished brass, each	$9.75	12.25

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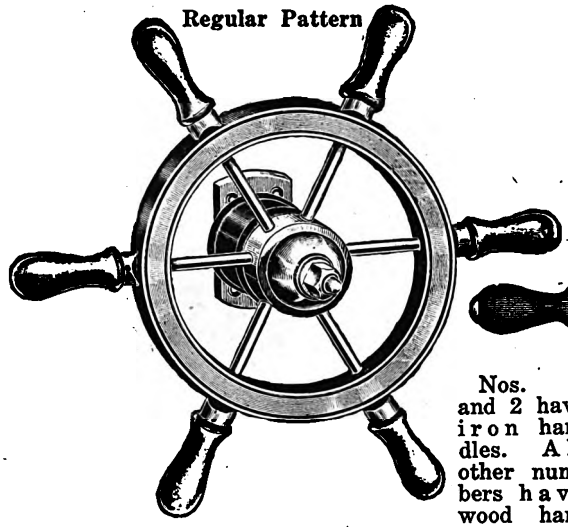
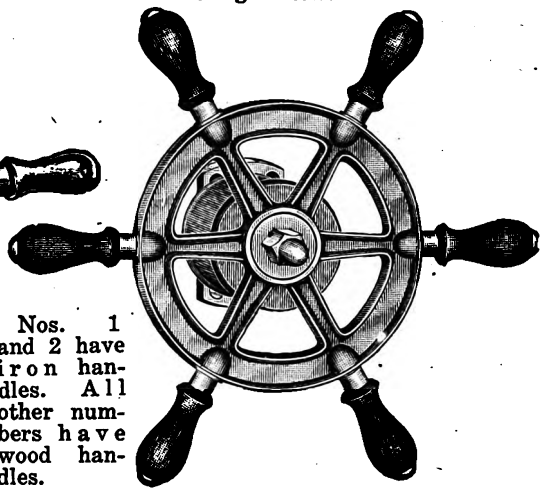
LAUNCH STEERING WHEELS

GALVANIZED IRON

Regular Pattern



Nutmeg Pattern



Nos. 1 and 2 have iron handles. All other numbers have wood handles.

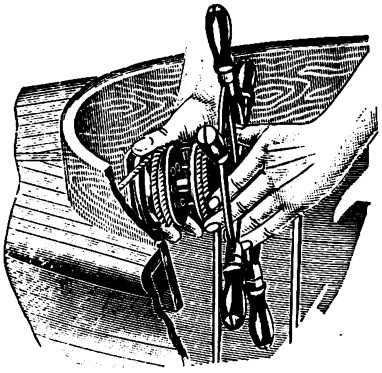
Regular Pattern

Nos.	1	2	3	4	5	51
Size wheel, in.	12	16	12	16	20	25
Diam. drum, in.	2½	3	2½	3	4	4
Length drum, in.	3	3½	3	3½	4¼	6
Each	$3.50	5.00	4.50	6.00	10.00	14.00

Nutmeg Pattern

Nos.	03	04	05
Size wheel, in.	12	16	20
Diam. drum, in.	2½	3	4
Length drum, in.	3	3½	4½
Each	$2.75	3.45	8.30

With No-Slack Drum



By removing the nut which secures the wheel, and rotating the two sections of the drum in opposite directions, the wheel rope may be tightened or slackened at will. No turnbuckles or other additional devices necessary. Common sash cord may be successfully used for wheel ropes.

Inches	Galvanized	Brass
12	$4.25	$8.00
16	5.45	10.00
20	12.30	21.75

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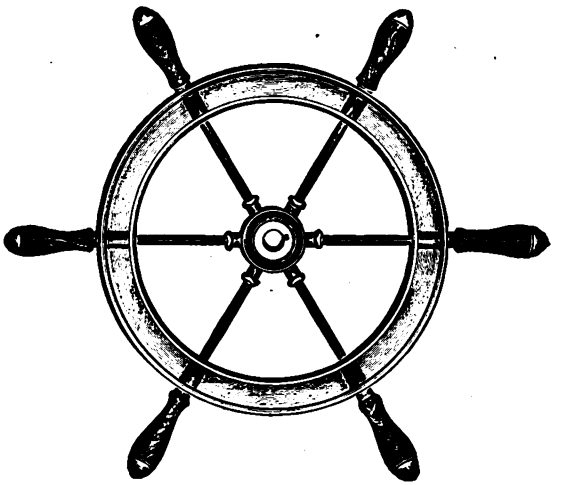
STEERING WHEELS



GALVANIZED IRON

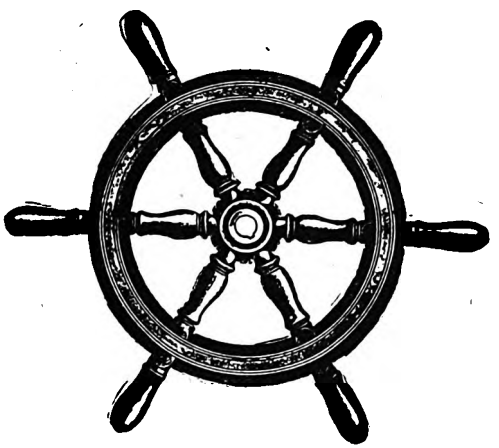
Iron Handles

Diameter Inches	No. of Spokes	Standard Size Hole in Hub Inches	Galvanized Each
12	6	⅝	$2.00
16	6	⅝	2.50

Wood Handles, Brass Tips

12	6	⅝	$2.50
16	6	⅝	3.50
20	6	15/16	4.00
22	6	15/16	4.50
25	6	1	5.00
28	6	1⅛	6.00
30	8	1¼	8.00
36	8	1⅜	10.00
42	8	1¾	14.00
48	8	1⅞	16.00

Wheels are measured by diameter from end to end of handles.



WOOD

Locust, Hickory or Mahogany Spokes, Mahogany Rims, Brass Hub

Diam. Inches	No. of Spokes	For Diameter Shaft Inches	With Brass Cheeks Each	With Bunged Rim Each	With Inlaid Rim Each
20	5	Any size from ¾ to 1¼	$18.00	$21.00	$22.00
24	6		20.50	23.00	24.10
28	6		27.50	29.80	32.00
30	6		34.75	36.75	38.50
32	6		.....	38.50	40.50
34	6		.....	40.50	42.20
36	6		46.00	42.20	44.00
42	8		59.00	57.00	60.50

The keyway in the hub is ¼x¼ in. unless otherwise ordered.

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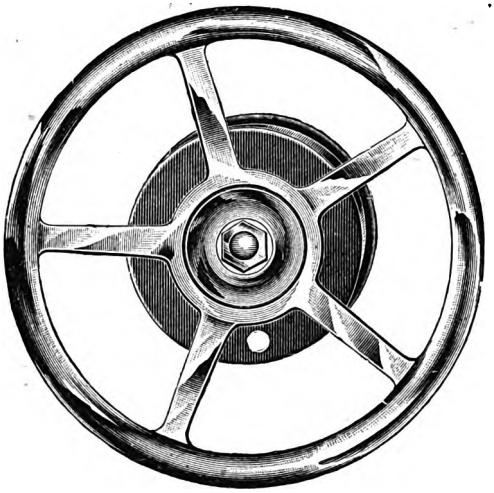
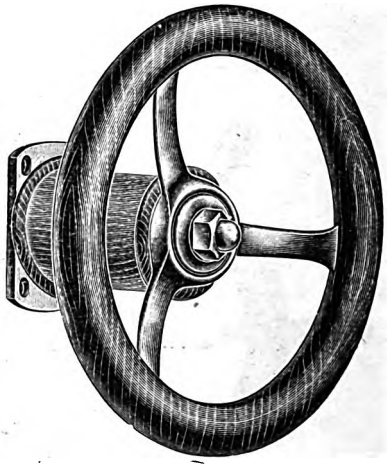
STEERING WHEELS AND LEVERS

SIDE STEERING WHEELS



All Metal Wheel
Mahogany or Oak Drum

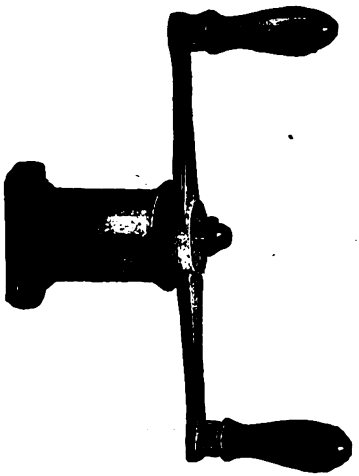
Size of Wheel Inches	Diameter of Drum Inches	Length of Drum Inches	Galvanized Iron Each	Polished Brass Each
6	2½	2	$4.50	$5.50
9	3	2	5.00	6.00
12	3½	3½	8.00	10.00



Wood Rim
Polished Brass Spokes

Size No.	Diameter of Wheel Inches	Diameter of Drum Inches	Length of Drum Inches	Each
1	7½	2½	2	$5.00
2	10½	3	2	6.00
3	13	3½	3½	10.00
4	16	4	3½	12.00

Nos. 2, 3 and 4 have four spokes.



SIDE STEERING LEVER
Polished Brass
Mahogany or Oak Handles and Drum

Size No.	Length of Lever Inches	Diameter of Drum Inches	Length of Drum Inches	Each
1	9	2½	3	$6.00
2	12	2½	3½	7.50

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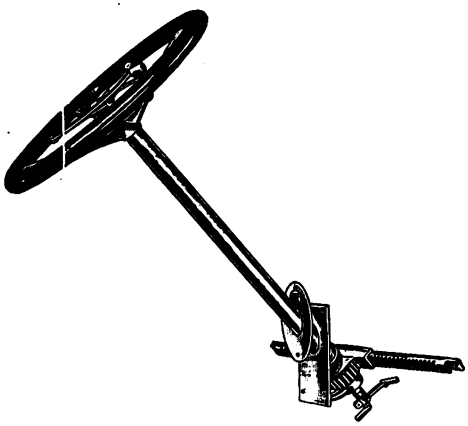
BOAT STEERERS

THE W. C. AUTO-BOAT STEERER

The special features of the W. C. steerer are strength and correct mechanical construction. The pinion, or drum (as the case may be), is keyed firmly to a heavy brass steering post between an upper and lower bearing. This divides the strain and makes for an easy working steerer. Spark and throttle controls are incorporated in the steerer, controlling levers of the smooth friction type being conveniently placed inside the wheel. The bracket is of ample size and rigidly braced. All metal parts are of brass with exposed surfaces highly polished.

Model A

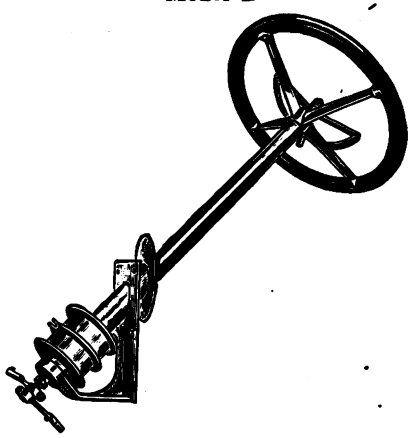


Column, 1½ in. diameter, any length to 24 in. (measure from bracket plate to top of wheel).

Rack, 21 in. long. Pinion, 3 in. diameter.

Wheel, No. 1 light spider, 17 in. laminated hardwood rim, mahogany finish, screwed on. Polished brass, each.....$32.00

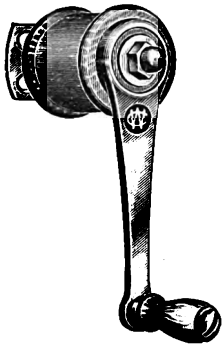
Model B



Column, 1½ in. diameter, any length to 24 in. (measure from bracket plate to top of wheel).

Drum, 3½ in. diameter, hollow brass with dividing rim and tiller rope clamp.

Wheel, No. 1 light spider, 17 in. laminated hardwood rim, mahogany finish, screwed on. Polished brass, each.....$30.00



SINGLE LEVER STEERER

Polished Brass Crank and Plate, Hardwood Handle and Drum

Length of crank, in.....	6
Diameter of drum, in.....	2½
Length of drum, in.....	3
Polished brass, each.....	$3.00

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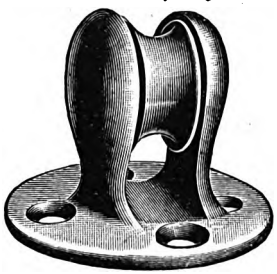
TILLER ROPE GUIDES AND LEADERS

TILLER ROPE GUIDES

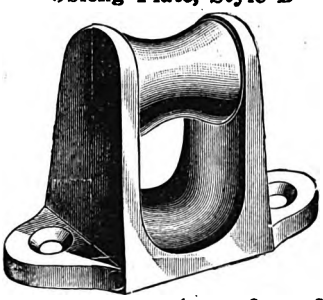
Galvanized Iron and Brass

Round Plate, Style A



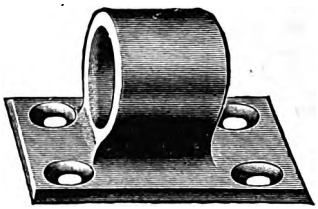
Nos.	1	2	3
Score, in.	¼	5/16	⅜
Galvanized, per doz.	$1.50	2.50	3.00
Plain brass, per doz.	2.50	3.00	4.00
Polished brass, per doz.	3.00	3.50	4.50

Oblong Plate, Style B



Nos.	1	2	3	4
Size opening, in.	½	⅝	¾	⅞
Plain brass, per doz.	$3.50	4.00	5.00	6.00
Pol. brass, per doz.	4.50	5.00	6.00	7.00

Square Plate, Style C

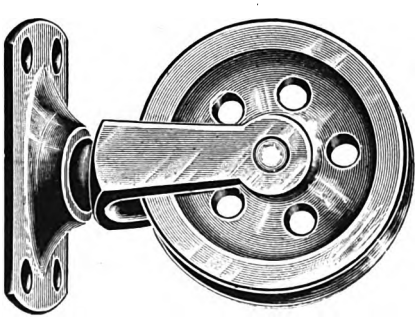


Nos.	0	1	2
Size hole, in.	⅜	½	⅝
Galvanized, per doz.	$0.50	.60	.75
Plain brass, per doz.	.90	1.00	2.00
Polished brass, per doz.	1.75	2.00	3.00

Oval Plate, Style D

Nos.	0	1	2
Size hole, in.	⅜	½	⅝
Galvanized, per doz.	$0.50	.60	.75
Plain brass, per doz.	.90	1.00	2.00
Polished brass, per doz.	1.75	2.00	3.00

SWIVEL TILLER ROPE LEADERS



Plain Brass

Size, in.	1	2
For rope, in.	¼ or 5/16	5/16 or ⅜
Size of sheave, in.	1⅞x7/16	3x9/16
Size of base, in.	2¼x1½	3½x2⅛
Each	$0.50	1.00

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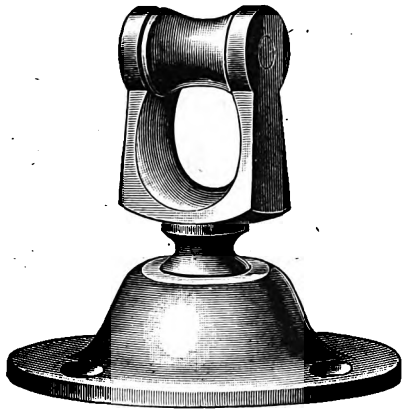
LEADERS, SCREWS, ETC.

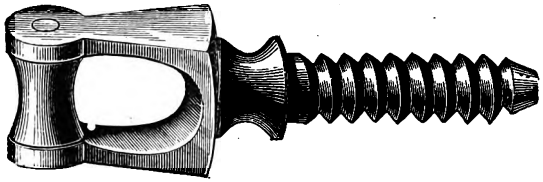
FAIR LEADERS

Swivel, Pulley and Ball Socket



Nos.	1	2	3	4
Opening, in.	½	⅝	¾	⅞
Diam. base, in.	2½	2¾	3	3¼
Plain brass, per doz.	$4.00	4.50	5.50	7.50
Pol. brass, per doz.	4.50	5.00	6.00	8.00

Screw, with Sheave



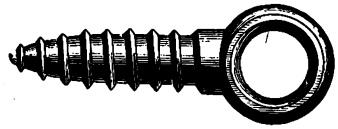
Nos.	1	2	3	4
Opening, in.	½	⅝	¾	⅞
Plain, per doz.	$3.50	4.00	4.50	6.25
Polished, per doz.	4.00	4.50	5.00	7.00

Babbitt Metal

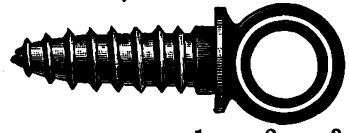
Nos.	1	2
Size hole, in.	¼	⅜
With screw, per doz.	$0.60	.75
Without screw, per doz.	.50	.60

LACING EYES

Regular

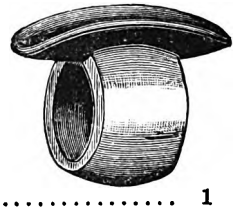


With Shoulder



Nos.	1	2	3	4
Diam. eye, in.	5/16	⅜	½	⅝
Length of stem under eye, in.	1	1¼	1½	2
Galvanized, per doz.	$0.20	.30	.40	.80
Plain brass, per doz.	.50	.75	1.00	1.50
Pol. brass, per doz.	1.00	1.25	1.75	2.25

With Lip for Foot of Sail



Nos.	1	2	3
Diam. of eye, in.	5/16	⅜	½
Galvanized, per doz.	$0.20	.30	.40
Plain brass, per doz.	.50	.75	1.00
Polished brass, per doz.	1.00	1.25	1.75

LIP SHEET LEADERS

Size No.	1	2
Small opening, in.	½	⅞
Size base, in.	2x1	2⅞x1¼
Plain brass, per doz.	$1.25	1.75
Polished brass, per doz.	2.00	2.50
Size No.	3	4
Small opening, in.	1⅛	1¼
Size base, in.	3⅜x1 5/16	3½x1¾
Plain brass, per doz.	$2.50	3.00
Polished brass, per doz.	3.50	4.00

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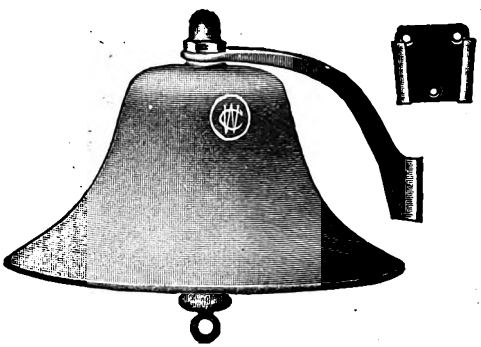
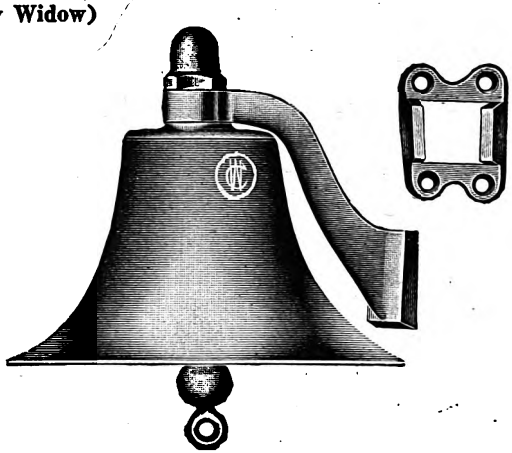
SIGNAL AND BINNACLE BELLS

SPECIAL LIGHT PATTERN
(Merry Widow)



Wrought Brass

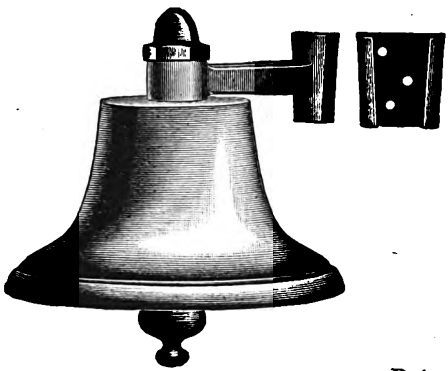


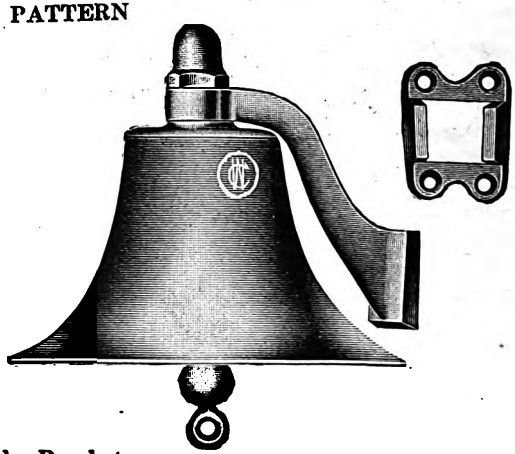
Cast Brass

Detachable Bracket

Diameter Inches	Wrought Brass Rough Each	Wrought Brass Polished Each	Cast Brass Rough Each	Cast Brass Polished Each
6	$0.80	$0.90	$1.10	$1.30
8	1.70	1.90	2.00	2.20

MEDIUM PATTERN





Detachable Bracket

Size No.	Diameter Inches	Rough Bell and Bracket Each	Bell and All Parts Highly Polished Each
1	6	$4.20	$5.20
2	7	6.35	7.50
3	8	7.48	8.86

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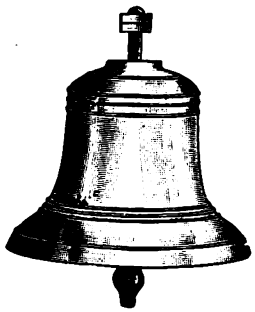
FOG SIGNAL AND ALARM BELLS

For Use on Sailing Vessels of All Kinds, Steam Yachts, Tugs, Barges, Ferries, Etc.



Price with Clapper and Bolt

Bell Diameter Inches	Weight Bell Pounds	Bright Finish Each	Highly Polished Each
8½	13	$4.70	$7.00
9½	16	5.80	9.40
10½	20	7.20	10.20
11	25	9.00	12.40
12	30	10.80	14.80
12½	35	12.60	17.10
13	40	14.40	19.45
14	50	18.00	23.60
15	60	21.60	27.30
16	70	25.20	31.20
17	80	28.80	35.00
17½	100	36.00	42.50

Weight of bell always includes clapper, bolt and nut.

Price of Bell and Bracket Complete

Bell Diameter Inches	Weight of Bell Only Pounds	Good Bright Fin. Iron Nut and Bracket Each	Highly Pol. Brass Nut and Bracket Each
6	4	$1.68	$2.64
8	9	3.77	5.45
8¼	11	4.37	8.36
8½	12¾	5.40	10.64
9½	16½	6.89	12.92
10½	19¾	8.03	15.13
11¼	24½	9.97	18.03
11¾	30½	12.25	21.39
12¼	34	13.79	24.10
13	38½	15.48	26.49
14	46½	18.95	31.16
15	57	22.72	35.68
15¾	64	25.64	39.32
16¾	70	28.16	42.04
17½	102	39.77	54.55

Bells hung in this bracket can be bolted to mast, side of cabin, or any other convenient place. Can furnish the arm and acorn nut either of iron or brass as may be desired.

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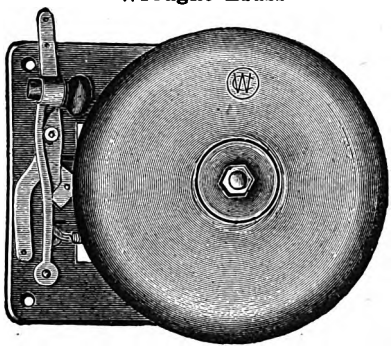
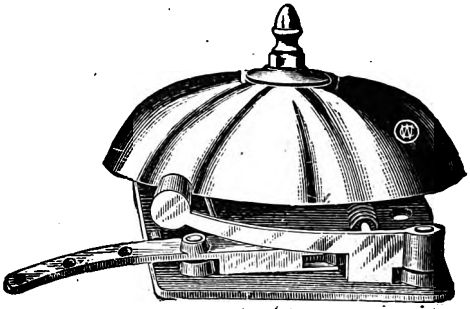
BELLS, PULLS AND SPRINGS

TRIP GONG BELLS

Wrought Brass



Bell Metal



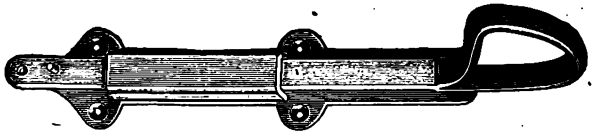
Wrought brass gongs made in 3, 4, 5, 6, 7, 8, 10, 12 inch sizes

Size Inches	With Iron Bases Dozen	With Brass Bases Dozen	Size Inches	With Iron Bases Dozen	With Brass Bases Dozen
3	$10.00	.....	12	$150.00	$186.00
4	12.50	$17.00	14	212.00	278.00
5	16.50	21.00	15	236.00	...
6	24.00	31.50	16	260.00	336.00
7	34.00	41.50	18	310.00	.....
8	46.00	61.00	20	each, 40.00	.....
9	70.00	95.00	24	each, 98.00	.....
10	84.00	108.00			

Gongs above 8 inches have wood hammers

BELL PULLS

Finished Brass. Polished Handles



For Steamboats, Yachts, etc.

Nos.	0	1	2	3
Pull, in.	1⅝	2⅜	3⅜	3⅜
Per dozen	$8.00	9.75	11.00	13.00

BELL SPRINGS

Brass

Length, in.	4	5	6	8	10	12
Per dozen	$1.00	1.25	2.00	4.00	5.00	6.00

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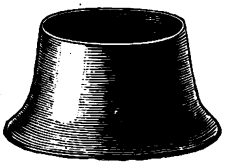
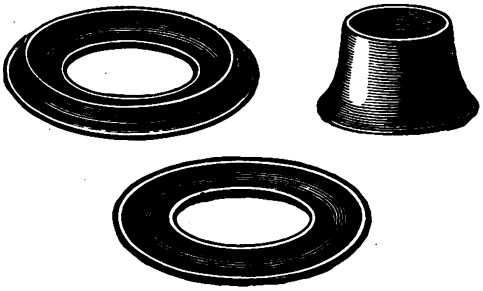
GROMMETS

BRASS EYELET GROMMETS



Size Hole Inches	Die Required	Per Gross
⅜	No. 1 Die, Style A	$1.15
½	No. 2 Die, Style A	1.35
⅝	No. 3 Die, Style A	1.60
¾	No. 4 Die, Style A	1.80
⅞	No. 5 Die, Style A	2.25
1	No. 6 Die, Style A	2.70
1⅛	No. 7 Die, Style A	3.15
1¼	No. 8 Die, Style A	5.00
1⅜	No. 9 Die, Style A	6.00
1½	No. 10 Die, Style A	7.00
1¾	No. 11 Die, Style A	8.00
2½	No. 15 Die, Style A	15.00

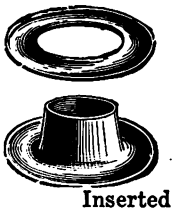
BRASS THREE-PART GROMMETS



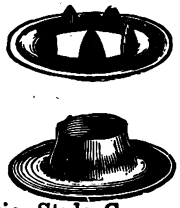
Inserted with Die, Style A

No.	Size Hole	Per Gross
1	¼ in. when inserted	$1.80
2	5/16 in. when inserted	2.00
3	⅜ in. when inserted	2.70
4	½ in. when inserted	3.60
5	⅝ in. when inserted	4.75
6	¾ in. when inserted	6.25
7	13/16 in. when inserted	8.50
8	15/16 in. when inserted	10.00
9	1 1/16 in. when inserted	12.00
10	1¼ in. when inserted	14.00
15	2½ in. when inserted	30.00

PLAIN WASHER



TEETH WASHER



Inserted with Die, Style C

Sheet Brass, Plain

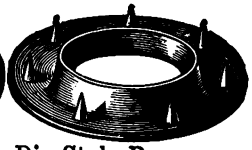
Nos.	3/0	2/0	0	1	2
Hole, in.	3/32	⅛	3/16	¼	⅜
Per gross	$0.40	.45	.50	.80	1.10
Nos.	3	4	5	6	
Hole, in.	7/16	9/16	⅝	⅞	
Per gross	$1.50	2.50	3.50	5.00	

Sheet Brass Teeth Washer

Nos.	0	1	2	3	4	5
Hole, in.	3/16	¼	⅜	7/16	9/16	⅝
Per gr.	$0.60	.90	1.25	1.75	2.75	4.00

PATENT SPUR

CONICAL POINT



Inserted with Die Style B

Brass Tube and Top Patent Spur

Nos.	0	1	2	3	4
Hole, in.	¼	5/16	⅜	7/16	½
Per gross	$1.60	1.80	2.00	2.70	3.60
Nos.	5	6	7	8	
Hole, in.	⅝	¾	⅞	1 1/16	
Per gross	$4.75	6.25	8.50	10.00	

Brass Tubes, Heavy Cast Brass Top, Conical Points

Nos.	2	3	4	5	6	7	8
Hole, in.	⅜	7/16	½	⅝	¾	⅞	1 1/16
Per gr.	$2.00	2.70	3.60	4.75	6.25	8.50	10.00

LIGHT CONICAL POINT

Inserted with Die Style B

Sheet Brass Tubes and Tops

Nos.	2	3	4	5
Hole, in.	⅜	7/16	½	⅝
Per gross	$2.00	2.70	3.60	4.75

For Inserting Dies, See Next Page

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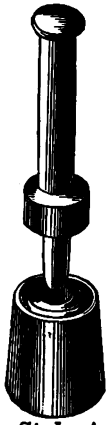
GROMMET DIES, CUTTERS AND RINGS

INSERTING DIES

For Grommets



Style A

Inserts Eyelets and Three Part Grommets

Nos.	1	2	3	4	5	6
Each	$2.15	2.25	2.35	2.50	2.70	2.80
Nos.	7	8	9	10	11	15
Each	$3.00	3.25	3.50	4.50	10.00	15.00

Style B

Inserts Patent Spur and Conical Point Grommets

Nos.	0	1	2	3	4
Each	$2.00	2.15	2.25	2.35	2.50
Nos.		5	6	7	8
Each		$2.70	2.80	3.00	3.25

Style C

Inserts Sheet Brass and Teeth Grommets

Nos.	3/0	2/0	0	1	2
Each	$2.00	2.00	2.00	2.15	2.25
Nos.		3	4	5	6
Each		$2.35	2.50	2.70	3.00

Use wood mallet with above dies

Midget

Small, for Sheet Brass Washer and Teeth Grommets Only

Nos. 0, 1, 2, 3.....each, $0.60

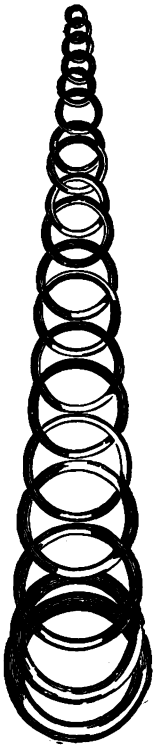
PATENT CUTTERS

For punching holes for grommets

Nos.	0	1	2	3	4	5	6
Hole, in.	1/4	5/16	11/32	3/8	7/16	1/2	9/16
Each	$1.00	1.00	1.25	1.30	1.50	1.75	2.00
Nos.	7	8	9	10	11	15	
Hole, in.	11/16	7/8	15/16	1 1/4	1 1/2	2	
Each	$2.25	2.50	2.75	3.00	15.00	25.00	

GROMMET RINGS

Galvanized Malleable Iron



Light

Inside Diam., In.	Per Gross
1/4	$0.30
5/16	.32
3/8	.35
7/16	.38
1/2	.40
9/16	.43
5/8	.45
11/16	.55
3/4	.65
13/16	.70
7/8	.85
15/16	1.00
1	1.15
1 1/16	1.30
1 1/8	1.60
1 1/4	2.00
1 3/8	2.60
1 1/2	3.00
1 3/4	3.85
2	4.75
2 1/4	5.25
2 3/8	5.50
2 1/2	7.50

Heavy

Inside Diameter Inches	Per Gross	Inside Diameter Inches	Per Gross
1/2	$0.55	1 1/8	$2.50
9/16	.65	1 1/4	3.15
5/8	.70	1 3/8	3.60
11/16	.80	1 1/2	4.00
3/4	.90	1 3/4	5.40
13/16	1.15	2	7.20
7/8	1.20	2 1/4	8.55
15/16	1.35	2 1/2	9.25
1	1.60	2 3/4	11.70
1 1/16	2.00	3	13.00

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MAST HOOPS, BALLS AND SLIDES

MAST HOOPS

Galvanized Wrought Iron

Diameter of wire ¼ inch

Size, in.	2	2½	3	3½
Per doz.	$0.50	.55	.60	.70
Size, in.	4	5	5½	6
Per doz.	$0.85	1.10	1.20	1.30
Size, in.	6½	7	7½	8
Per doz.	$1.35	1.40	1.50	1.65

Wood Mast Hoops

All sizes from 6 to 36 inches

Per in. $0.02

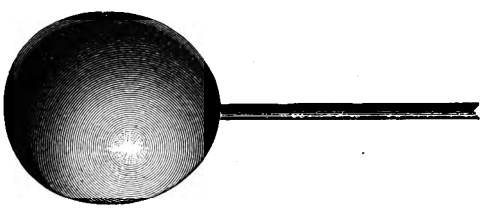
Yacht Mast Hoops

Copper Riveted

All sizes from 3 to 14 inches

Per in. $0.02

MAST BALLS



Wood Gold Leafed, Galvanized Stem

Diam. ball, in.	2	2½	3	3½
Each	$0.45	.60	.80	1.00
Diam. ball, in.		4	5	6
Each		$1.35	2.00	2.25

Zinc, Galvanized Stem

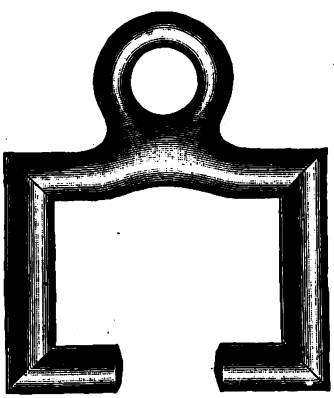
Diam. ball, in.	6	7	8	9
Each	$3.00	4.50	5.50	6.50
Diam. ball, in.		10	12	14
Each		$7.75	12.00	21.00

Copper, Brass Stem

Diam. ball, in.	6	7	8	9
Each	$4.00	6.00	7.50	8.25
Diam. ball, in.		10	12	14
Each		$9.50	15.00	24.00

MAST SLIDES

With and Without Eye



Galvanized Iron

1½ in., with or without eye, per doz., $0.40

Hard Bronze

Size, in.	1	1¼	1½	1¾
Per dozen	$0.50	1.00	1.30	1.75

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TOPMAST TRUCKS, DEAD EYES, ETC.

TOPMAST TRUCKS

Lignumvitae

Diameter Inches	Two Holes Each	One Sheave Each	Two Sheaves Each
2	$0.20	$0.45	$0.65
2½	.20	.45	.65
3	.20	.45	.65
3½	.22	.50	.70
4	.25	.55	.80
4½	.28	.60	.90
5	.33	.65	1.00
5½	.38	.75	1.10
6	.45	.85	1.20
7	1.00	1.50	2.00
8	1.50	2.00	2.50

DEAD EYES

Lignumvitae

Upper for Rope Strap

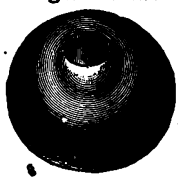
Lower for Iron Strap

In ordering, state whether scores are to be for hemp rope, wire rope, single or double iron strap.

Diam., in	2	2½	3	3½	4	4½
Each	$0.42	.42	.42	.49	.56	.63
Diam., in.	5	5½	6	6½	7	
Each	$0.70	.77	.84	.91	1.35	

PARREL TRUCKS

Lignumvitae



Diam., in.	⅝ to 1¼	1½ to 2	2¼ to 2½		
Per doz.	$0.40	.75	1.00		
Diam., in.	2¾	3	3¼	3½	4
Per doz.	$1.25	1.55	1.90	2.05	3.00

BULLSEYES OR LIZARDS

Lignumvitae

Diameter Inches	Thickness Inches	Diameter of Hole Inches	Width of Score Inches	Per Dozen
1	⅝	⅜	¼	$0.60
1¼	11/16	½	5/16	.60
1½	⅞	⅝	⅜	.70
1¾	1	¾	½	.70
2	1⅛	⅞	½	.80
2¼	1¼	⅞	9/16	.90
2½	1⅜	1	⅝	1.00
2¾	1⅜	1⅛	⅝	1.20
3	1½	1¼	¾	1.50
3¼	1⅝	1¼	⅞	1.70
3½	1¾	1⅜	1	2.00
3¾	1⅞	1⅜	1	2.40
4	2	1½	1⅛	2.80
4¼	2⅛	1½	1⅛	3.20
4½	2¼	1⅝	1¼	3.70
4¾	2⅜	1⅝	1¼	4.75
5	2½	1¾	1⅜	5.50

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NEEDLES AND HOOKS

SAILMAKERS' NEEDLES

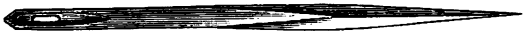
Long Square

Nos.	17	17½	16	16½	15	15½	14	14½
Per 100	$1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.10
Nos.	13	12	11	10	9	8	7	6
Per 100	$1.30	1.80	2.70	3.60	4.50	5.40	6.60	7.80

Reduced Edge

Nos.	17	16	16½	15	15½	14	14½	13
Per 100	$1.70	1.70	1.70	1.70	1.70	1.85	1.85	2.85

(Lolley's Pattern) Short Square



	Per Hundred		Per Hundred
Flat seam	$1.00	Small bolt rope	$2.00
Tabline	1.00	Middle bolt rope	2.50
Oldwork	1.10	Large bolt rope	3.30
Store	1.25	Small marline	4.20
Head rope	1.50	Large marline	5.40

PACKING OR SACK NEEDLES

Nos.	15	14	13	12	11	10	9	8	7	6	5
Size, in.	2½	3	3½	4	4½	5	5½	6	6½	7¼	8½
Per gross	$1.00	1.00	1.10	1.30	1.65	2.00	2.75	3.50	4.50	5.50	6.00

Straight packing needles furnished to order

SAILMAKERS' STEEL BENCH HOOKS

Plain Eye

Small .....per doz., $1.00
Large .....per doz., 1.25

Brass Swivel

Swivel eye .....per doz., $1.50

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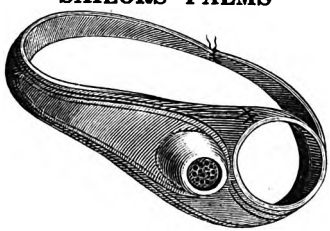
SAILMAKERS' PALMS, HEAVERS, ETC.

SAILORS' PALMS

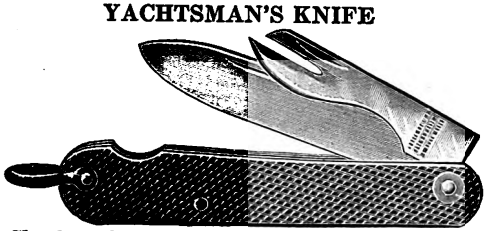


No.		Each
1	Half hide mounted, seaming	$1.50
2	Full hide mounted, seaming	2.00
3	Brass mounted, seaming	2.00
4	Hide and brass mounted, seaming	2.25
5	Hide mounted, seaming, with buckle	2.50
6	All hide seaming, extra stitched, with buckle	5.25
7	All hide seaming, extra stitched	6.50
8	All hide roping, extra stitched	8.00
9	Common roping palm for sailors	2.25

Left Hand Palms

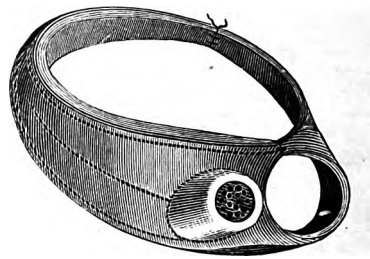
No.		Each
1	Half hide mounted, seaming	$1.50
2	Full hide mounted, seaming	2.00

YACHTSMAN'S KNIFE



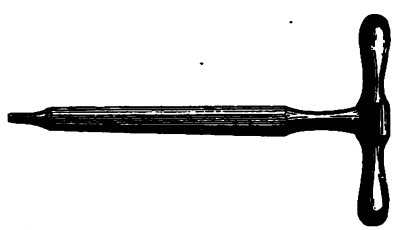
Checkered black handle, with chain shackle, best steel blades....each, $..

SAILMAKERS' PALMS



		Seaming	Roping
Cribbie's	each,	$3.25	3.75
Smith's	each,	2.00	2.50
Read's	each,	1.50	2.00

SAILMAKERS' HEAVERS



No.	Length Inches		Each
1	6¾	Common	$1.00
2	6¾	Wrought iron, case hardened	1.75
3	6¾	Best tool steel	2.50

SAILMAKERS' MARLINE SPIKES

Best Tool Steel, Wood Handles

No.	Length Inches	Each
1	13	$2.00
2	14½	2.25

Furnished with fancy wood handles, brass capped, to order

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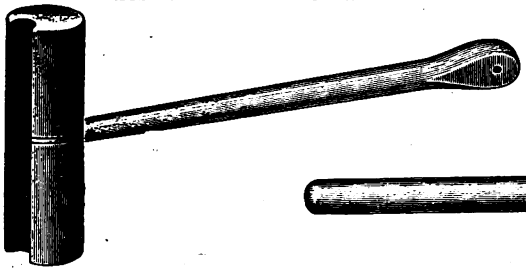
SPLICING AND SERVING TOOLS

CRINGLE OR STANDING FIDS

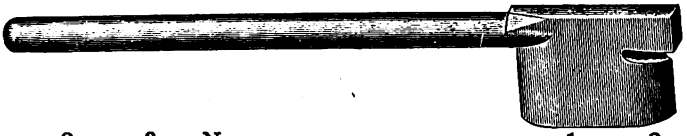
Seasoned Hickory

Nos.	1	2	3	4
Length, in.	30	32	36	40
Diameter of butt, in	4	5	6	6½
Each	$2.00	2.50	3.00	3.50

SERVING MALLETS



SERVING BOARDS

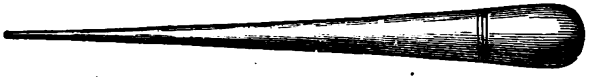


Nos.	1	2	3
Size, in.	2x7	2½x7½	3x8
Hickory, per doz	$6.00	7.00	8.00
Lignumvitae, per doz	9.00	10.00	12.50

Nos.	1	2
Size, in.	3½x3½	4x4
Ash, per doz	$7.00	9.00
Lignumvitae, per doz	11.50	14.00

HAND FIDS

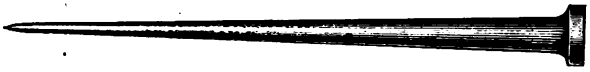
Second Growth Hickory



Nos.	1	2	3	4	5
Length, in.	14	16	18½	2½	22
Each	$0.50	.60	.75	1.00	1.25

WIRE ROPE MARLINE SPIKES

Tool Steel, Polished



Length, in.	6	8	12	14	16	18	20
Price per dozen	$10.00	12.00	16.00	18.00	21.00	24.00	27.00

MARLINE SPIKES

Tempered Steel

Length, in.	6	8	10	11	12	13	14	15	16	18
Price per doz,	$3.00	3.50	4.00	4.50	5.00	5.50	6.50	7.50	9.50	11.50

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ROPE AND CORDAGE

MANILA ROPE

¾ in. diam and larger.....base
⅝ in. diam. .....½c over base
9/16, ½ and 7/16 in.....1c over base
⅜ in. .....1½c over base
5/16 and ¼ in.....2c over base
3/16 in. .....2½c over base

Approximate Weight and Strength of Plain Laid Manila Rope

Approximate Circumference	Diameter Inches	Number Feet in One Lb. (About)	Strength of New Rope Lbs.	Approx. Weight of 1200 Feet
6 thr'd fine	3/16	75	....	16
6 thread	¼	55	620	24
9 thread	5/16	38	1,000	34
12 thread	⅜	26	1,600	46
15 thread	⅜ full	20	1,900	64
18 thread	7/16	18	2,100	78
21 thread	½	13	2,400	90
1¾ inch	9/16	10	3,300	132
2 inch	⅝	8	4,000	150
2¼ inch	¾	6	4,700	190
2½ inch	13/16	5	5,600	200
2¾ inch	⅞	4½	6,500	275
3 inch	1	3½	7,500	320
3½ inch	1⅛	2½	10,500	410
3¾ inch	1¼	2¼	12,500	500
4 inch	1 5/16	2	14,000	570
4¼ inch	1⅜	1¾	15,400	640
4½ inch	1½	1⅔	17,000	750
5 inch	1⅝	1⅓	20,000	900
5½ inch	1¾	1 1/12	25,000	1,100
6 inch	2	10½ in.	30,000	1,300
6½ inch	2⅛	9 in.	33,000	1,610
7 inch	2¼	8 in.	37,000	1,800
7½ inch	2½	7 in.	43,000	2,000
8 inch	2⅝	6 in.	50,000	2,250
8½ inch	2⅞	5½ in.	56,000	2,600
9 inch	3	4¾ in.	62,000	2,850

MANILA ROPE

Three Strand Regular Laid

Four Strand Regular Laid

Three Strand Hawser Laid

Four strand, regular grades.....1c extra
Bolt rope, 3 or 4 strand.....special
Transmission rope, 4 strand; this rope is treated with a special lubricant which is designed to reduce internal friction .....special
Unoiled goods, unless otherwise ordered manila rope, contains a certain amount of lubricating oil; if wanted without oil.....1c extra
Lariat rope extra hard twist, 3 strand .....2c extra
Lariat rope extra hard twist, 4 strand .....3c extra
Drilling cable and sand lines, hawser laid and treated with a special lubricant .....special
Hawser laid rope.....1c extra
Tarred rope .....base
Laid goods .....½c extra
Balling .....¼c extra
Hay rope, hide rope, bale rope, and spun yarn, medium or coarse..... .....½c over base
Spun yarn, fine.....1c over base
Lath yarn, tarred and ring, yarn untarred, medium or coarse.....base
Lath yarn, fine.....½c over base
Fodder yarn, tarred, medium or coarse .....½c under base
Fodder yarn, fine.....base
Single end 1 ply tarred yarns or ring yarn, untarred, in coils or on reels, medium or coarse.....½c extra
Same, fine .....1c extra
All lengths less than 600 ft.....1c extra

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TWINE AND CORDAGE

COTTON ROPE

A Cotton, all sizes, $\frac{3}{16}$ to 1 in. in coils
A Cotton, ¼, $\frac{5}{16}$ and ⅜ in. in 50 lb. reels.
No. 1 $\frac{3}{32}$ in., 10 lb. tubes, 100 lb. bales.
No. 2 ⅛ in., 10 lb. tubes, 100 lb. bales.
No. 3 $\frac{5}{32}$ in., 10 lb. tubes, 100 lb. bales.
B Cotton, ¼, $\frac{5}{16}$ and ⅜ in., 50 lb. reels.

EUCLID SASH CORD

Bales and Coils

Nos. 6, 7, 8, 10—6 doz. hank to bale.

Euclid in 1500 ft. coils from No. 6 to ¾ in.

Also carry Cedar grade in hanks from 6 to 8.

TROT LINE

In 100 lb. barrels

No. 00— ¾ lb. balls	No. 2—1½ lb. balls
No. 0—1 lb. balls	No. 3—1¾ lb. balls
No. 1—1¼ lb. balls	

COTTON STAGING

	Balls	Sacks	Bales
12, 15, 18, 21, 24, 27 30, 36	2 & 4 oz.	5 lb.	100 lb.

MEDIUM COTTON SEINE TWINE

Bibb's Osprey Lake Erie Lay

6, 9, 12, 15, 18, 24 in ½ lb. balls, 125 lb. bbls.

	Pkgs.	Bales
Skeins	5 & 10 lb.	100 lb.
27 to 120 thread	5 & 10 lb.	100 lb.
16 thread soft	5 & 10 lb.	100 lb.

SAIL TWINE

Cotton, 4, 5, 6, 8 to 30 ply—½ lb. balls, 125 lb. bbls.

Italian or Diamond Baling, 3, 4, 6 ply—skeins, 12 lb. pkgs., 144 lb. bales.

Linen Finish, 3 ply and up—skeins, 12 lb. pkgs., 144 lb. bales.

AA Linen, 3 ply and up—skeins, 12 lb. pkgs., 144 lb. bales.

Silver Finish, 3 ply and up—skeins, 12 lb. pkgs., 144 lb. bales.

Also sail twine to order, many ends, coils or reels.

We can furnish any twine in rope form, many ends, in coils or on wood reels.

Twines of flax, linen, jute and cotton in any color made to order.

COTTON WRAPPING TWINE

Euclid and Cedar

3 and 4 ply, 6 balls to pound, 5 lb. sacks, 100 lb. bales. 4 oz. balls, loose, in 100 lb. barrels, Euclid—in 2 lb. cones, 100 lb. bbls.

10, 12, 16, 24, 30 ply Euclid, ½ lb. balls. Loose in 125 lb. bbls.

BUTCHERS' COTTON TWINE

3, 4, 6 ply—6 balls to lb., 100 lb. bbls. Can get any ply up to 30 ply.

CABLE LAID SEA ISLAND TWINE

Assorted

2 oz. balls, 2½ lb. Cones

Pink, lt. blue, dk. blue, brown, dk. green, lt. green, lavender, orange, purple, red, slate, yellow. (From mill promptly)

LINEN AND COTTON VARIEGATED AND SOLID COLOR DRUG TWINES

¼ lb. Balls—Blue, Green, Red

Blue and white—green and white—red and white. (From mill promptly)

COLORED SOFT CABLE LAID MACRAME

Blue, Green, Orange, Red
(From mill promptly)

WHITE SOFT CABLE LAID MACRAME

No. 9-12 ..... ½ lb. balls
(From mill promptly)

Nos. 721 and 821 WHITE POLISHED TWINE

½ lb. balls in 3 lb. pkgs.
140 lb. bales

CAYUGA LINEN FINISHED AND POLISHED TWINE

From 38 all sizes to 608—balls, tubes and reels, single or many ends.
White—Colors

BROOM TWINE

Flax, Linen Finished Cotton

Red and green in stock. Can get any color.

Skeins in 18 lb. pkgs.

½ lb. balls in 3 lb. pkgs., 140 lb. bales.

Can obtain from mill, in coils, many ends or reels.

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TWINE AND CORDAGE

AA AMERICAN AND JAVA HEMP WALLPAPER TWINE

	Balls	Bales	Reels
4, 5, 6 and 8 ply	10 lb.	500 lb.	
5 and 6 ply	10 lb.	500 lb.	100 lb.

MATTRESS TWINE

½ lb. balls in 3 lb. pkgs., 140 lb. bales
252 Columbia
252 Special
15 Columbia
15 Special

FINISHED INDIA TWINE

Dark Color, Light Color

No. 4½—2 Ply, ½, ¼ and 1 lb. balls
No. 6 —3 Ply, ½, ¼ and 1 lb. balls
No. 7 —3 Ply, ½ and 1½ lb. balls
No. 8 —3 Ply 2 lb. balls
No. 9 —4 Ply 3 lb. balls

Packed in 300 and 500 lb. bales, also single end on 50 lb. reels, or many ends in coils.

IOM LIGHT FINISHED TWINE

Same as Belgium, Mediterranean or Yucatan.

	Balls	Bales	Reels
No. 4½—2 Ply	1 lb.	500 lb.	50 lb.
No. 6 —3 Ply	1 lb.	500 lb.	50 lb.
No. 7 —3 Ply	1 lb.	500 lb.	50 lb.
No. 8 —3 Ply	1 lb.	500 lb.	50 lb.
No. 4½—2 Ply	1, 5, 10 lb.	500 lb.	50 lb.

(Also many ends in coils)

AMERICAN HEMP SPRING TWINE

	Balls	Bales	Reels
No. 5—3 Ply	1, 5, 10 lb.	500 lb.	50 lb.
No. 6—3 Ply	1, 5, 10 lb.	500 lb.	50 lb.
No. 7—3 Ply	1½, 10 lb.	500 lb.	50 lb.
No. 8—4 Ply	2 10 lb.	500 lb.	50 lb.

BEST TUBE CORD

		Reels	Balls	Bales
3	Ply	50 lb.		
4-5-6	Ply	50 lb.	10 lb.	300 lb.
8	Ply	50 lb.	25 lb.	500 lb.
10	Ply	50 lb.	25 lb.	500 lb.

Other plies made to order.

JUTE WRAPPING TWINE

UW No. 1, UW, W Grades

Balls	Bales
½ lb.	125 lb.

Single End 50 lb. Reels
Many Ends 50 and 100 lb. Coils

UNFINISHED INDIA OR PAPER MAKERS' TWINE

	Reels	Balls	Bales
3 Ply or No. 8	50 lb.		
4 Ply or No. 9	50 lb.	10 lb.	300 lb.

Coils to order

Hard—WOOL TWINE—Soft

	Balls	Bales
3 and 4 Ply soft	1 lb.	125 lb.
2, 3, and 4 Ply hard	1 lb.	125 lb.

B, BC, BB & MINOT FINISHED TWINES

	Balls in 3 lb. Pkgs.	Bales
Nos. 12-18	¼ and ½ lb.	140 lb.

Loose in barrels—
160 lb. barrels
24-36-48-60.....½ lb. balls in 3 lb. pkgs.
50 lb. reels
BB Dark Color BB Light Color

A & AB ITALIAN TWINE

Nos. 12-18-24-36-48-60
Balls, ½ lb. Bales, 140 lb.
Cable Laid Flax, all sizes.
Balls, ½ lb. Bales, 165 lb.

TARRED MARLINE

	Balls	Bbls.
No. 1 Medium	1 and 2½ lb.	125 lb.
No. 2 Medium	1 and 2½ lb.	125 lb.
Fine	1 lb.	125 lb.
Yacht	1 lb.	125 lb.
Houseline	2½ lb.	125 lb.

SISAL HAY ROPE

No.
1 Medium—1, 2 and 3 Ply oiled and unoiled
2 Medium—2 Ply oiled and unoiled
1 Fine—2, 3 Ply oiled and unoiled
2 Fine—2, 3 Ply oiled and unoiled
Reels and coils, many ends

SISAL HIDE ROPE

No.
1 Medium—2 and 3 Ply oiled and unoiled
2 Medium—2 and 3 Ply oiled and unoiled
1 Fine—2 and 3 Ply oiled and unoiled
2 Fine—3 Ply oiled and unoiled
Reels and coils, many ends.

YARNS

		Coils
130	Tarred fodder	50 and 100 lb.
200	Tarred fodder	50 and 100 lb.
130	Red Star tarred lath	100 lb.
AA	Tarred	100 lb.
AA	Untarred	100 lb.
130	Untarred ring yarn Nos. 1 & 2	100 lb.

EUCLID BINDER TWINE

5 lb. balls 50 lb. bales

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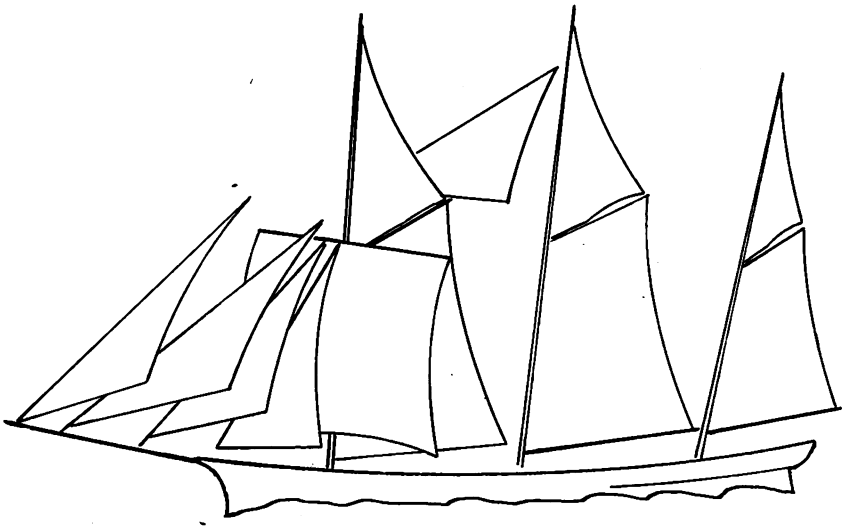
SAILS



Sailmaking is an art in which perfection can be attained only by long and careful study of the various conditions under which sails of different kinds are used, and also of the fabrics and methods of cutting best adapted to the case in hand. It is necessary to know exactly how different materials act under strain and also the nature and direction of the forces to which the sails will be subjected. Without this knowledge a durable even sail cannot be made.

This is one of our oldest departments and one in which we take great pride, our sailmakers are men of long experience and are assisted by the most skilful workers to be obtained.

We are prepared to furnish sails of any kind or material for any craft from the smallest canoe to the largest ship as promptly as is consistent with perfect workmanship.

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MEASURING FOR SAILS

Exercise the greatest care in measurements. If your boat or yacht is sparred, send us exact length of masts, boom and gaffs, with the following measurements:

The distance from bowsprit end to mast.

The distance from stem to mast.

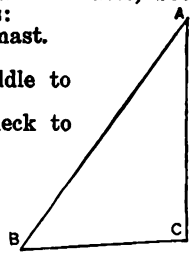
The distance from gooseneck or saddle to throat halyard block.

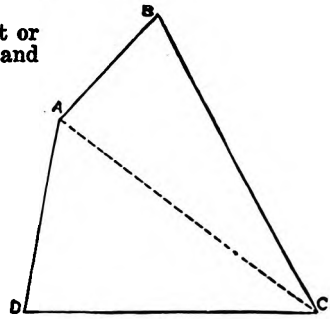
The distance from saddle or gooseneck to deck.

The distance from throat to clew, called "diagonal."

The length of each jib stay.

Send designs, plan or blue print, if possible.





FORE AND AFT SAILS

A to B Length of gaff.....Ft.....In.
A to C Diagonal .....Ft.....In.
A to D Length on mast.....Ft.....In.
D to C Length of boom.....Ft.....In.
B to C Length on leach.....Ft.....In.

JIB AND STAY SAILS

A to B Length on stay.....Ft.....In.
A to C Length on leach.....Ft.....In.
B to C Length of foot.....Ft.....In.

GAFF TOPSAILS

For gaff topsails, it is necessary to know the distance from the gaff topsail halyard block to sheave hole at end of gaff, and from same to throat halyard block; also length of gaff from center of jaws to sheave hole.

State whether you wish a working topsail or a club topsail—if the latter, state length of club and yard.

BALLOON JIBS AND SPINNAKERS

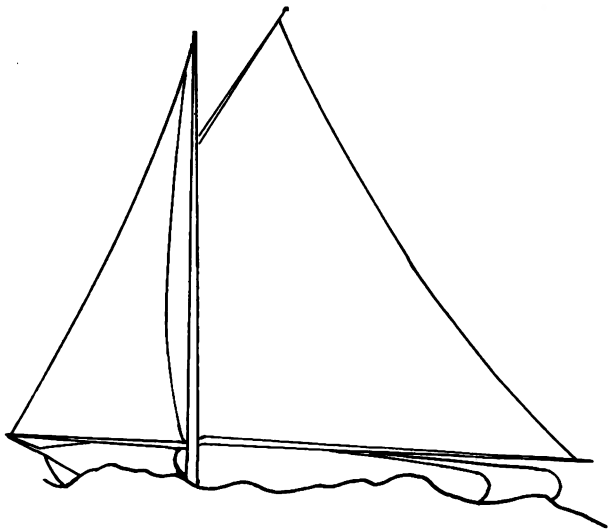
Distance from bowsprit end to mast.

Distance from mast at deck to spinnaker or balloon jib halyard block. Length of spinnaker pole.

SAIL COVERS

For Jibs. State length of sail when furled and the girth at three or four points.

For Fore and Aft Sails. State length of both boom and gaff, diameter of mast at gooseneck, girth of furled sail (including spars) at mast, at gaff end and at boom end; also the exact distance from mast to each block on the gaff, and to topping-lift-band on boom, if any.



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COTTON DUCK

In this department we carry a large and varied assortment for sails, tents, covers, etc., and can supply all widths and weights.

STANDARD WIDE DUCK IN ROLLS ABOUT 100 YARDS EACH

List per Yard

SUBJECT TO TRADE DISCOUNT

Width	1	2	3	4	5	6	7	8	9	10	11	12	Width
26 in.	1.67	1.57	1.48	1.40	1.34	1.25	1.18	1.10	1.03	.94	.86	.77	26 in.
28 in.	1.79	1.69	1.59	1.51	1.43	1.35	1.27	1.19	1.11	1.01	.92	.83	28 in.
30 in.	1.92	1.82	1.71	1.62	1.53	1.44	1.36	1.27	1.19	1.09	.99	.89	30 in.
32 in.	2.05	1.92	1.82	1.72	1.63	1.54	1.46	1.35	1.27	1.16	1.05	.95	32 in.
34 in.	2.16	2.04	1.92	1.82	1.72	1.62	1.53	1.43	1.34	1.22	1.11	1.00	34 in.
36 in.	2.29	2.16	2.03	1.92	1.82	1.72	1.62	1.51	1.42	1.29	1.18	1.06	36 in.
38 in.	2.41	2.28	2.15	2.03	1.92	1.82	1.71	1.60	1.49	1.37	1.24	1.12	38 in.
40 in.	2.54	2.40	2.26	2.14	2.03	1.91	1.80	1.68	1.57	1.44	1.30	1.17	40 in.
42 in.	2.65	2.50	2.35	2.22	2.11	1.99	1.88	1.75	1.64	1.50	1.36	1.22	42 in.
44 in.	2.77	2.62	2.46	2.33	2.21	2.08	1.96	1.83	1.72	1.57	1.42	1.28	44 in.
46 in.	2.90	2.74	2.58	2.44	2.31	2.18	2.06	1.92	1.80	1.64	1.49	1.34	46 in.
48 in.	3.05	2.88	2.71	2.56	2.43	2.29	2.16	2.01	1.89	1.72	1.56	1.41	48 in.
50 in.	3.18	3.00	2.82	2.67	2.53	2.39	2.25	2.10	1.97	1.79	1.63	1.47	50 in.
52 in.	3.30	3.12	2.94	2.77	2.63	2.49	2.34	2.18	2.04	1.87	1.69	1.52	52 in.
54 in.	3.46	3.26	3.07	2.90	2.75	2.60	2.45	2.28	2.14	1.95	1.77	1.59	54 in.
56 in.	3.58	3.38	3.19	3.01	2.85	2.70	2.54	2.37	2.21	2.02	1.84	1.65	56 in.
58 in.	3.71	3.51	3.30	3.12	2.96	2.80	2.63	2.45	2.29	2.10	1.90	1.71	58 in.
60 in.	3.87	3.66	3.44	3.25	3.08	2.91	2.75	2.55	2.39	2.18	1.98	1.78	60 in.
62 in.	4.00	3.78	3.56	3.36	3.19	3.00	2.84	2.64	2.47	2.26	2.05	1.84	62 in.
64 in.	4.13	3.90	3.67	3.47	3.29	3.10	2.93	2.72	2.55	2.32	2.11	1.90	64 in.
66 in.	4.29	4.05	3.81	3.60	3.42	3.22	3.04	2.83	2.65	2.42	2.19	1.97	66 in.
68 in.	4.42	4.18	3.93	3.71	3.52	3.32	3.13	2.92	2.73	2.49	2.26	2.03	68 in.
70 in.	4.55	4.30	4.05	3.82	3.62	3.42	3.23	3.00	2.81	2.56	2.33	2.09	70 in.
72 in.	4.72	4.46	4.19	3.96	3.76	3.54	3.34	3.11	2.91	2.66	2.41	2.17	72 in.
76 in.	5.02	4.74	4.46	4.21	4.00	3.77	3.55	3.31	3.09	2.82	2.56	2.30	76 in.
80 in.	5.28	4.99	4.70	4.44	4.20	3.96	3.74	3.48	3.25	2.97	2.70	2.42	80 in.
84 in.	5.59	5.28	4.97	4.69	4.45	4.19	3.96	3.68	3.44	3.14	2.85	2.56	84 in.
90 in.	6.03	5.70	5.36	5.07	4.80	4.53	4.27	3.97	3.72	3.39	3.07	2.76	90 in.
96 in.	6.48	6.12	5.76	5.45	5.16	4.86	4.59	4.26	3.99	3.64	3.30	2.96	96 in.
100 in.	6.81	6.43	6.05	5.71	5.41	5.10	4.81	4.47	4.18	3.81	3.46	3.11	100 in.
104 in.	7.08	6.69	6.29	5.94	5.63	5.31	5.00	4.65	4.35	3.96	3.60	3.23	104 in.
108 in.	7.40	6.99	6.58	6.22	5.89	5.55	5.23	4.86	4.54	4.15	3.76	3.38	108 in.
112 in.	7.74	7.30	6.88	6.49	6.15	5.79	5.46	5.08	4.74	4.33	3.92	3.52	112 in.
120 in.	8.41	7.94	7.48	7.06	6.69	6.30	5.94	5.52	5.15	4.70	4.26	3.82	120 in.
132 in.	10.27	9.69	9.12	8.61	8.14	7.66	7.20	6.66	6.23	5.67	5.13	4.60	132 in.
144 in.	12.60	11.90	11.20	10.56	9.97	9.37	8.79	8.15	7.57	6.89	6.22	5.56	144 in.

Revised Sept. 15, 1920

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COTTON DUCK

In this department we carry a large and varied assortment for sails, tents, covers, etc., and can supply all widths and weights.

STANDARD WIDE DUCK IN ROLLS ABOUT 100 YARDS EACH

List per Yard

Nos.	1-0	1	2	3	4	5	6	7	8	9	10	11	12
26 in.	$0.58	$0.55	$0.52	$0.49	$0.46	$0.43	$0.40	$0.39	$0.35	$0.33	$0.30	$0.28	$0.26
28 in.	.62	.59	.56	.53	.49	.46	.43	.42	.38	.35	.32	.30	.28
30 in.	.67	.63	.60	.56	.53	.49	.46	.44	.41	.38	.34	.33	.29
32 in.	.71	.68	.64	.60	.56	.53	.49	.47	.43	.40	.36	.35	.30
34 in.	.76	.72	.68	.64	.60	.56	.52	.50	.46	.43	.39	.37	.32
36 in.	.80	.76	.72	.68	.63	.59	.55	.53	.49	.45	.41	.39	.34
38 in.	.85	.80	.76	.71	.67	.62	.58	.56	.52	.48	.43	.41	.36
40 in.	.89	.84	.80	.75	.70	.66	.61	.59	.54	.50	.45	.43	.38
42 in.	.93	.89	.84	.79	.74	.69	.64	.62	.57	.53	.48	.45	.40
44 in.	.98	.93	.88	.82	.77	.72	.67	.65	.60	.55	.50	.47	.42
46 in.	1.02	.97	.92	.86	.81	.75	.70	.68	.62	.58	.52	.50	.44
48 in.	1.08	1.03	.97	.91	.86	.80	.74	.72	.65	.61	.55	.53	.46
50 in.	1.14	1.08	1.02	.96	.90	.84	.78	.75	.69	.64	.58	.55	.48
52 in.	1.18	1.12	1.06	1.00	.94	.87	.81	.78	.72	.67	.60	.57	.50
54 in.	1.23	1.16	1.10	1.04	.97	.91	.84	.81	.75	.70	.63	.59	.52
56 in.	1.27	1.21	1.14	1.07	1.01	.94	.87	.84	.78	.72	.65	.62	.54
58 in.	1.32	1.25	1.18	1.11	1.05	.97	.90	.87	.80	.75	.67	.64	.56
60 in.	1.39	1.32	1.24	1.17	1.10	1.02	.95	.92	.84	.78	.70	.67	.59
62 in.	1.44	1.37	1.29	1.22	1.14	1.07	.99	.96	.88	.81	.73	.70	.61
64 in.	1.49	1.41	1.33	1.26	1.18	1.10	1.02	.99	.90	.84	.76	.72	.63
66 in.	1.54	1.46	1.38	1.29	1.21	1.13	1.05	1.02	.93	.87	.78	.74	.65
68 in.	1.58	1.50	1.42	1.33	1.25	1.17	1.08	1.05	.96	.89	.80	.76	.67
70 in.	1.63	1.54	1.46	1.37	1.29	1.20	1.12	1.08	.99	.92	.83	.78	.69
72 in.	1.71	1.62	1.53	1.44	1.35	1.26	1.17	1.13	1.04	.97	.87	.82	.72
74 in.	1.76	1.67	1.58	1.48	1.39	1.30	1.21	1.17	1.07	.99	.89	.85	.74
76 in.	1.81	1.71	1.62	1.52	1.43	1.33	1.24	1.20	1.10	1.02	.92	.87	.76
78 in.	1.86	1.76	1.66	1.56	1.47	1.37	1.27	1.23	1.13	1.05	.94	.89	.78
80 in.	1.90	1.80	1.70	1.60	1.50	1.40	1.30	1.26	1.16	1.07	.97	.91	.80
82 in.	1.95	1.85	1.75	1.64	1.54	1.44	1.34	1.29	1.18	1.10	.99	.94	.82
84 in.	2.00	1.89	1.79	1.68	1.58	1.47	1.37	1.32	1.21	1.13	1.01	.96	.84
86 in.	2.14	2.03	1.92	1.80	1.69	1.58	1.47	1.41	1.29	1.20	1.08	1.02	.89
88 in.	2.19	2.08	1.96	1.84	1.73	1.62	1.50	1.44	1.32	1.23	1.11	1.04	.91
90 in.	2.24	2.12	2.00	1.89	1.77	1.65	1.53	1.48	1.35	1.26	1.13	1.07	.94
92 in.	2.29	2.17	2.05	1.93	1.81	1.69	1.57	1.51	1.38	1.29	1.16	1.09	.96
94 in.	2.34	2.22	2.09	1.97	1.85	1.72	1.60	1.54	1.41	1.31	1.18	1.11	.98
96 in.	2.39	2.26	2.14	2.01	1.89	1.76	1.64	1.58	1.44	1.34	1.21	1.14	1.00
98 in.	2.49	2.36	2.23	2.10	1.97	1.84	1.71	1.64	1.51	1.40	1.26	1.18	1.04
100 in.	2.54	2.41	2.27	2.14	2.01	1.87	1.74	1.67	1.54	1.43	1.28	1.21	1.06
102 in.	2.59	2.46	2.32	2.18	2.05	1.91	1.78	1.71	1.57	1.45	1.31	1.23	1.08
104 in.	2.64	2.50	2.37	2.23	2.09	1.95	1.81	1.74	1.60	1.48	1.33	1.26	1.10
106 in.	2.69	2.55	2.41	2.27	2.13	1.99	1.84	1.78	1.63	1.51	1.36	1.28	1.12
108 in.	2.74	2.60	2.46	2.31	2.17	2.02	1.88	1.81	1.66	1.54	1.39	1.31	1.14
110 in.	2.91	2.76	2.61	2.45	2.30	2.15	2.00	1.92	1.76	1.63	1.47	1.38	1.21
112 in.	2.97	2.81	2.65	2.50	2.34	2.19	2.03	1.95	1.79	1.66	1.49	1.40	1.23
120 in.	3.18	3.01	2.84	2.68	2.51	2.34	2.18	2.09	1.92	1.78	1.60	1.50	1.32

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DUCKS, DRILLS AND SHEETINGS

SAIL DUCK

Hard, Soft and Medium

Per Yard

No.	22 In.	24 In.	No.	22 In.	24 In.
2/0	$1.28	1.40	6	$0.88	.96
0	1.22	1.32	7	.84	.92
1	1.16	1.26	8	.80	.86
2	1.08	1.18	9	.76	.82
3	1.02	1.12	10	.70	.76
4	.98	1.06	11	.66	.72
5	.92	1.00	12	.62	.68

ARMY DUCK

Per Yard, 50 Yards in a Piece

7 oz., 28½ in. wide.....$....
8 oz., 28½ in. wide..... ....
9 oz., 28½ in. wide..... ....
10 oz., 28½ in. wide..... ....
12 oz., 28½ in. wide..... ....

Single filled

8 oz., 29 in. wide.....$....
9 oz., 29 in. wide..... ....
10 oz., 29 in. wide..... ....
11 oz., 29 in. wide..... ....
12 oz., 29 in. wide..... ....
8 oz., 36 in. wide..... ....
10 oz., 36 in. wide..... ....
12 oz., 36 in. wide..... ....
10 oz., 40 in. wide..... ....
11 oz., 40 in. wide..... ...

Double filled

CEDAR AND EUCLID BRANDS

8 oz., 29 in. wide.....$....
9 oz., 29 in. wide..... ....
10 oz., 29 in. wide..... ...
12 oz., 29 in. wide..... ....
8 oz., 36 in. wide..... ....
10 oz., 36 in. wide..... ....
12 oz., 36 in. wide..... ....

DRILLS

Per Yard, 50 Yards in a Piece

30 in. No. 250 regular .....$....
30 in. No. 250 boat ....
30 in. No. 300 regular ....
37 in. No. 250 regular ....
37 in. No. 300 regular ....

HOSE DUCK

Per Yard, 40 inches wide

10 ounce .....$....
12 ounce ....
14 ounce ....
16 ounce ....
18 ounce ....
20 ounce ....
22 ounce ....
24 ounce ....
26 ounce ....
28 ounce ....
30 ounce ....

WATERPROOF DUCK

Oiled or Preservo

Per Yard

Width, in.....	28	30	36	40	44
6 ounce	$....	....	....	....	....
8 ounce	....	....	....	....	....
10 ounce	....	....	....	....	....
12 ounce	....	....	....	....	....

BLACK OILED DUCK

Waterproof

Inches Wide	Per Yard No. 10	No. 12	No. 14
36	$....	....	....
40	....	....	....
44	....	....	....
48	....	....	....
50	....	....	....
54	....	....	....
56	....	....	....
60	....	....	....
66	....	....	....
72	....	....	....
84	....	....	....

DYED DUCK

Brown, Tan or Slate

Per Yard, 50 Yards in a Piece

Width, in.	28	30	36	40	44
6	$....	....	....	....	....
8	....	....	....	....	....
10	....	....	....	....	....
12	....	....	....	....	....

SHEETING, UNBLEACHED

Per Yard, 36 in. Wide

Nos.

300	325	375	400	550	600	775	920
$....	....	....	....	....	....	....	....

AWNING STRIPES

We carry a very complete assortment of fancy awning stripes and are constantly adding novelties to the line. We issue a sample book showing patterns of stripes which will be sent on request.

50 Yard Pieces, 31 Inches Wide

Brown and white.....$....
Green and white..... ....
Tan and white ....
Red and white..... ....
Blue and white..... ....

Also solid khaki, 8 and 10 ounce single and double filled.

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MARINE SUPPLIES

AWNING BRAID

On Three Gross Spools

Carried in red, white, blue, green, brown, khaki, tan.

Per spool .....$....

AWNING FRINGE

2½, 3, 4 and 5 Inches Wide

Carried in white, red, blue, tan, khaki, brown, green.

Per yard .....$....

BUNTING

Rolls 40 Yards

Navy wool, red, white, blue, green, black and yellow.

18 in. standard.....per yd. ,$....
24 in. standard.....per yd., ...
36 in. standard.....per yd., ...
18 in. R. R., signal, red, white and green .....per yd., ...

FILTER CLOTH

20 to 60 Inches Wide in 150 Yard Rolls

Wider than 38 in. shipped from factory. Carried in a variety of weaves suitable for filtration of: Mineral colors and pigments, clay, whiting, varnish, cotton seed oil, animal oils, olive oil, fruit juices, wine, sugar liquors, pharmaceuticals, explosives, insecticides, paraffine, wax, petroleum by-products and metallurgical precipitates of every kind.

Samples and prices on request.

PRESS CLOTHS

To fit Paterson, Griffith & Wedge, Bonnott, Crossley and other machines. Price on application.

TAPE

¼ to 3 Inches Wide, Inclusive

Bleached .....per yd., $....
Unbleached .....per yd., ...

OLD SAILS

Heavy weight for contractors and mine use, can furnish on short notice anything made of same.

Prices on application.

CURLED HAIR

We furnish hair of all grades, black, gray, mixed or white.

Price on application.

KAPOC

A special non-absorbent fibre having greater buoyancy than cork.

In 100 lb. bales.....per lb., $....

HAIR FELT

Thickness, in.	½	¾	1
Per sq. ft.	$0.04¾	.06¼	.07½
Thickness, in.	1¼	1½	2
Per sq. ft.	$0.09¼	.11	.14

60 and 72 inch wide carried in stock; 300 square feet in a bale.

WEBBINGS

Meteor	3, 3½, 4 in. wide..per pc.,	$....
Auto	3, 3½, 4 in. wide..per pc.,	....
Scotch	3, 3½, 4 in. wide..per pc.,	....
L. F. G.	3, 3½, 4 in. wide..per pc.,	....
B. F. M.	3, 3½, 4 in. wide per pc.,	....
L. M. C.	3, 3½, 4 in. wide..per pc.,	....

70 yards to the piece

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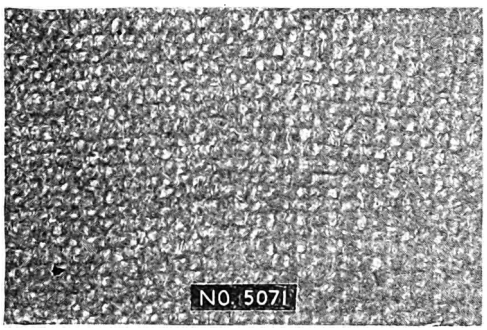
BRATTICE CLOTH, BURLAPS AND COVERS

BRATTICE CLOTH

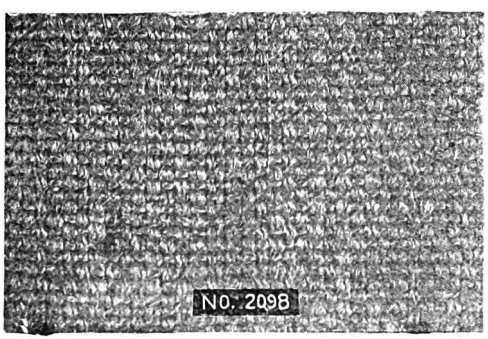
Combines extreme efficiency and extreme economy. Made out of carefully selected fibres, closely woven, and fireproofed by a chemically scientific process, which renders it non-inflammable and at same time practically rotproof.

Furnished in half rolls of about fifty yard lengths.



No. 5071

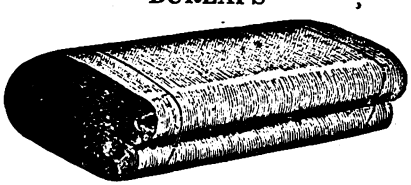
Width, in.	36	48	60	72	84	96
Per sq. yd. $	....	....	....	....	....	....



No. 2098

Width, in.	36	48	60	72	84	96
Per sq. yd. $	....	....	....	....	....	....

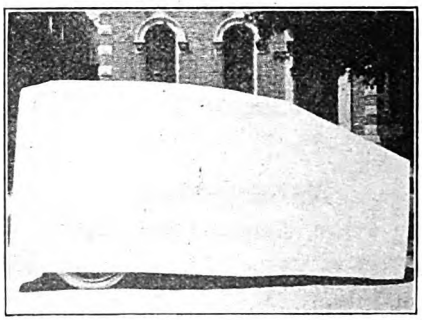
BURLAPS



In pieces of about 125 yards

Weight, oz.	7½	8	10	12
40 in. wide...per yd., $	....	....	....	....

AUTOMOBILE COVERS



Made of light sheeting, canvas, and waterproof fabrics. Straight or to fit, for any make of car.

Prices on application.

WAGON COVERS

Made to order, any size and of any weight material.

Price and samples on application.

HARVEST MACHINE COVERS

These covers are furnished to fit reapers, binders, harvesters, separators, etc., of any desired material.

Price and samples on receipt of specifications.

STACK COVERS

Furnished in any size, of 8, 10, 12 oz. duck, complete with eyelets and tie ropes.

Prices on application.

HORSE COVERS

Made of any material, plain waterproof or oiled, in any size or pattern.

Prices and samples on receipt of specifications.

CANVAS AND WATERPROOF GOODS

We are prepared to make in our own factory any special cover, bag or paulin desired. Prices quoted on receipt of specifications.

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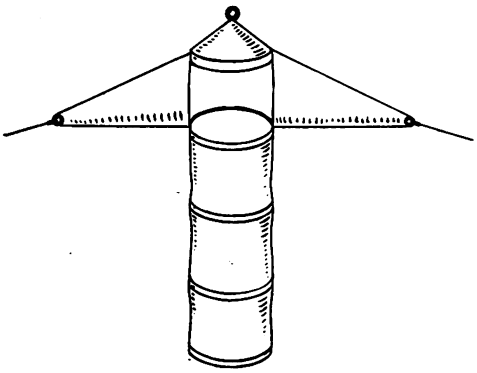
MARINE COVERS, ETC.

We manufacture and carry in stock plain or waterproof covers for all marine requirements. Some of those most commonly used are listed below, but we are prepared to make any special pattern promptly on receipt of specifications.

Tarpaulins	Floor covers
Weather cloths	Sounding machine covers
Dodgers	Dust curtains
Binnacle covers	Boat covers
Winch covers	Boat fall covers
Windlass covers	Ventilator covers
Telegraph covers	Tackle covers
Dynamo covers	Searchlight covers
Lead line covers	Steamship awnings
Wheel covers	Tool rolls

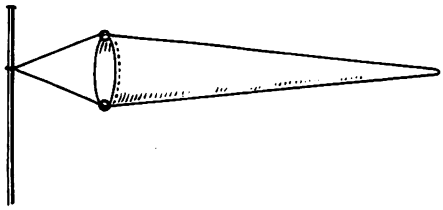
WIND SAILS

For Forcing Air Below Decks



Size No.	Diam. Inches	Height Inches	Each
1	8	8	$....
2	8	9	....
3	12	8	....
4	12	9	....

TELLTALE FLIES



Fly is made of best wool bunting in shape of hollow cone, made any length.

Prices on request.

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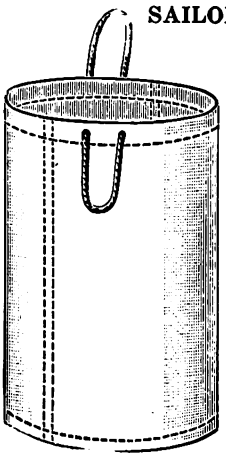
CANVAS BAGS, PAPERS, ETC.

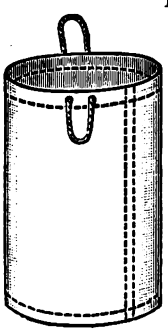
SAILORS' BAGS



Navy pattern with drawstring. The sailors' trunk. Also the ideal way to carry clothing to camp.

White duck .....each, $0.75
Waterproof duck .....each, 1.75

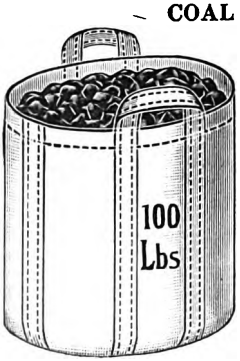
DITTY BAGS



Same as sailor bag but smaller, for miscellaneous articles.

		White Duck	Water-proof Duck
20x6 inches	each, $	....	....
28x9 inches	each,	....	....

COAL BAGS



Made of No. 4 duck sewed and riveted with copper rivets.

Per hundred $150.00

LAUNDRY BAGS

Washable, well made with heavy cord drawstring.

Size, in.	17x24	24x24	24x28	28x34
Drill, per 100....$	....	....	....	....
Sheeting, per 100.	....	....	....	....
Lt. duck, per 100.	....	....	....	....

COTTON MAILING BAGS

Made of light weight sheeting, in sizes ranging from 2½x4 to 5½x10 inches. Prices on application.

ADDING MACHINE PAPER

This paper will be found absolutely free from lint and dust, a characteristic well appreciated by all users of adding machines. Tightly wound on white hardwood spools. Prices on application.

Burroughs and Universal rolls made $2\frac{5}{16}$ and $3\frac{15}{32}$ in. wide, 3⅝ in. diam.

Standard machine rolls made 2, 2½ and 2⅞ in. wide, 2½ in. diam.

Comptograph rolls made 2½ and 3 in. wide, 2½ in. diam.

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OILED CLOTHING

WATERPROOF, BLACK OR YELLOW

Slicker

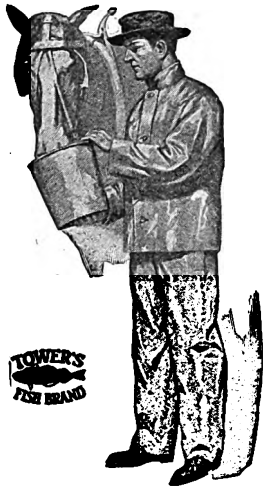
Medium Coat

Copyright, 1915, by A. J. Tower Co.

Overalls

© A. J. Tower Co.

Suit



Copyright, 1913, by A. J. Tower Co.

Protector

© A. J. Tower Co.

Tarp

© A. J. Tower Co.

SIZES OF OILED CLOTHING

Our garments are intended to be worn over regular clothing and are cut full.

Standard breast measure is 8 in. to 10 in. less.

	Sizes No.	Length	Fits Standard Breast Measures as below
Slickers	0	58	44-46
	1	56	41-43
	2	54	38-40
	3	52	35-37
Medium Coats	0	44	44-46
	1	44	41-43
	2	44	38-40
	3	44	35-37
Frocks	0	38	44-46
	1	38	41-43
	2	38	38-40
	3	38	35-37
Jackets	0	31	44-46
	1	30½	41-43
	2	30	38-40
	3	30	35-37
		Waist	Leg
Overall	0	48	32
	1	46	31
	2	44	30
	3	42	29

HATS—All hats for men are made in the following sizes, 6¾, 7, 7¼, 7½.

All clothing is guaranteed to be absolutely waterproof and not to become sticky.

Prices on request.

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YACHT CLOTHING AND RUBBER BOOTS

WHITE DUCK YACHT CLOTHING

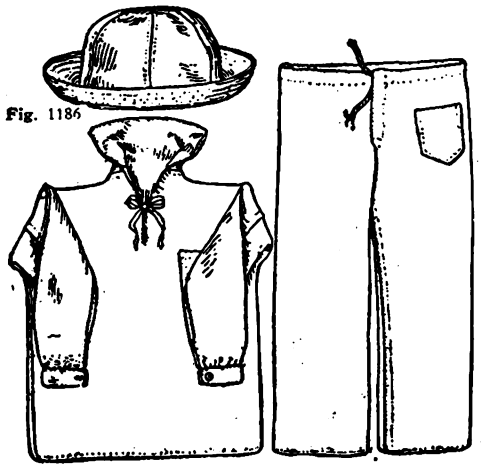

Fig. 1186

Hats .....each, $0.65
Pants .....each, 1.25
Jumpers .....each, 1.50

SLOP CHESTS

The slop chest is an assortment of clothing, boots, etc., carefully selected to replace the usual wear and loss on board ship. The assortment shown below is composed of durable materials, and will be found to meet all ordinary requirements.

24 Pairs firemen's boots.
12 Pairs rubber sea boots.
6 Long black oil coats.
12 Black sou'westers.
36 Undervests.
36 Underdrawers.
48 Pairs socks.
12 Sailors' blue serge pants.
12 Pairs canvas gloves.
6 Pairs oilskin pants.
6 Oilskin coats.

Price on application.

RUBBER BOOTS

Best grade rubber

Knee length .....per pair, $....
Sporting length .....per pair, ...
Hip length .....per pair, ...

Sizes 7 to 10.
Wading pants with boot feet..... ....
Wading pants with stocking feet.... ....

YACHTING OXFORDS

White Duck, Rubber Soled

We handle two grades of yachting oxfords. The best grade have white soles. The cheaper grade, black soles, in sizes from No. 7 to No. 10, men's sizes. Specify size and grade when ordering.

No. 1 .....per pair, $.....
No. 2 .....per pair, ...

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MATS

MAYFIELD GYMNASIUM MATS

Mayfield mats are made of two layers of 1 inch hair felt separated and covered by three thicknesses of burlap—this foundation thoroughly tufted and then bound—a mat in itself.

The above is covered with best quality of No. 8 white cotton duck, and the whole is again thoroughly tufted—the latter tufting coming in between those of the foundation.

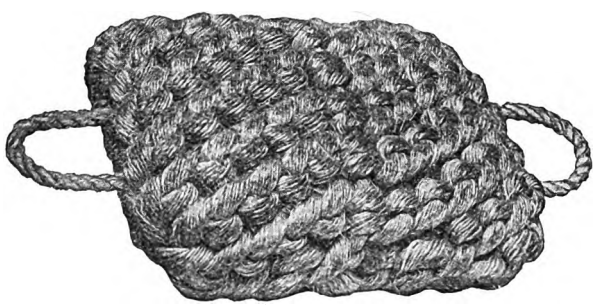
They have 50 to 60% more tuftings than found in other mats.

This double tufting and the three layers of burlap keep the felt from disintegrating and making a lumpy mat, something which usually results in cheaply constructed mats.

Mayfield mats are made and sewed by hand by experienced men—just another one of the points which help to make our mats outlive the ordinary kind by several years.

Made in any size to order. Price on application.

SIDEWALK MATS



Our Superior is an excellent mat which protects both the material and sidewalk from damage.

All sizes carried in stock or made to specifications.

Prices on application.

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BOAT FENDERS

CANVAS FENDERS

Single End, Cork Filled

Length, in.	12	15
Diameter, in.	3	3½
Each	$0.50	$0.75

Double End, Cork Filled

Rope goes through full length of fender.

Length, in.	16	18	22	22	24	36
Diam., in.	4	5	6	8	8	10
Each	$1.25	1.60	1.90	2.25	3.75	8.25

Larger sizes to order

CANVAS BOW FENDERS

For Yacht Tenders

No. 1 Round or bent .....each, $0.75
No. 2 Tripod .....each, 1.00

SENNATE FENDERS

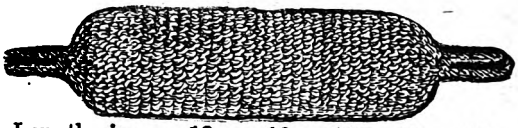
Manila Braided

Nos.	1	2	3	4
Length, in.	12	16	18	20
Each	$0.60	.75	1.00	1.20

FENDERS

A full line of pure manila and canvas fenders carried in stock. Also special sizes and styles made to specifications.

NETTED FENDERS



Length, in.	12	16	18	22	22
Diam., in.	3	4	5	6	8
Manila, each	$1.50	2.25	2.75	3.50	4.25
Cotton, each	1.75	2.50	3.25	4.50	5.00

NETTED FENDERS

Manila, Cotton or Tarred

Length	Manila Rope Each	Cotton Rope Each	Tarred Rope Each
8 in.	$1.50	$2.75	....
10 in.	1.75	3.00	....
12 in.	2.00	3.25	....
14 in.	2.25	3.50	....
16 in.	2.75	....	$2.50
18 in.	3.00	....	2.75
20 in.	3.25	....	3.00
22 in.	3.75	....	3.35

Netted Cotton

Size, In.	Each
4	$0.60
5	.80
6	1.00
7	1.20
8	1.50

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CUSHIONS AND LIFE PRESERVERS

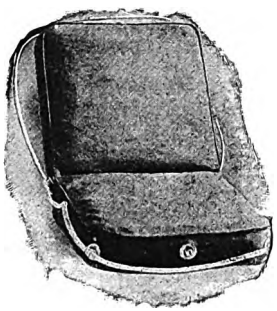
BOAT OR YACHT CUSHIONS

Our cushions are carefully made, corded and tufted and filled with either the best quality of cork shavings or kapoc, which is a special non-absorbent fibre having greater buoyancy than cork. All cushions are 1½ inches deep at the edges and about 2½ inches deep in the center.

When ordering, send paper pattern.

	Filled with Cork Shavings Per Sq. Ft.	Filled with Kapoc Per Sq. Ft.
All leather	$3.25	$4.00
Leather top and canvas bottom	2.80	3.25
Imitation leather top and bottom	1.40	1.90
Imitation leather top and canvas bottom	1.20	1.70
All canvas	.80	1.20
Corduroy top and bottom	1.40	1.90
Corduroy top and canvas bottom	1.20	1.70

CANOE OR BOAT CUSHIONS
Double



Covered with brown duck, life line attached.

No.	Seat, In.	Back, In.	Each
1	12x12	12x12	$5.50
2	15x15	15x15	7.50
3	12x14	12x20	7.00

Corduroy or leather, 15% extra

CANOE OR BOAT CUSHIONS
Single

Covered with brown duck, life line attached.

No.	Inches	Each
3	12x12	$2.75
4	12x14	3.00
5	12x20	4.00
6	12x24	4.50
7	12x15	3.25
8	15x15	3.75

Corduroy or leather 15% extra

COMBINATION PILLOW, CUSHION AND LIFE PRESERVER
Superior

A soft, downy, comfortable cushion or pillow that will hold its shape, always fluffy, will not mat down. A perfect camping pillow or cushion for wicker, yacht or piazza chair, boat or canoe. Covered with best Spanish artificial leather.

Colors—Maroon, tan or green.

Size 16x16 in.....each, $1.25

Are guaranteed to pass inspection as life preservers on pleasure boats and are stamped as required by the new motor boat law.

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LIFE PRESERVERS

EUCLID STANDARD LIFE PRESERVERS

Showing Life Preserver Ready for Use

This cut shows the life preserver ready for use. This preserver will support a man longer than he can live in the water. Leaves the arms free for swimming, rowing, or assisting others. Holds the head and shoulders up—the right place to apply support.

Made of special khaki and straps with a view to lightness and strength combined. Meets more requirements than the motor-boat laws require. Can be put on after capsize in water. Weighs 18 ounces; easily carried, making a neat bundle, suitable for cushion, in traveling.

Price each $2.00

NEVERSINK BELTS AND COATS

Neversink Swimming Belt

Swimming Belts

Is filled with best Java Kapok and made of stout, durable material, and cut out so that the arms have perfect freedom.

For men, women and children. Sizes 22 to 40.

Price each $4.00

Khaki Norfolk Coats With Buoyant Lining

We furnish these in light tan or dark olive in a very neat design. The cloth is firm and durable, and suitable for all occasions. The "Neversink" buoyant lining guarantees the wearer from sinking.

For men and women, sizes 32 to 44, average weight 3½ lbs.....$12.00

For children, sizes 22 to 30, average weight 2¼ lbs. 9.00

Sizes larger than 44, or stout sizes, extra.. 2.00

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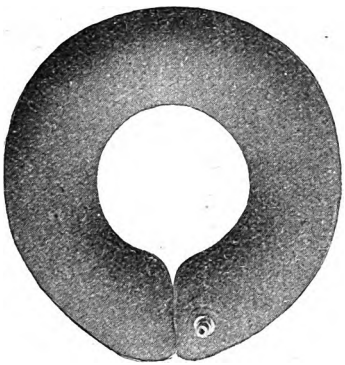
CUSHIONS, ANCHORS AND LIFE PRESERVERS

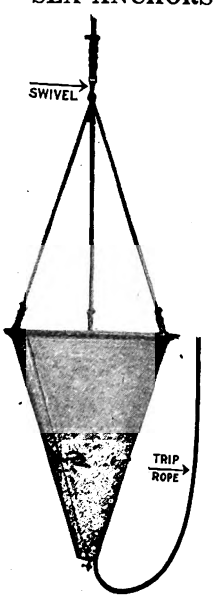
SPORTSMAN'S AIR CUSHIONS



A yoke to save your shoulders.
A swimming collar for those who can't swim.
A life preserver in case of accident.
A cushion while waiting for moose.
A cushion or head rest while waiting for duck.
A protection for your shoulder if your gun is heavy.
A cushion for camp, boat, office or home.
Carry it in your pocket. It weighs just one pound.

Price .....each, $3.00

SEA ANCHORS OR MARINE DRAGS



Contains can and oil. Conforms to U. S. steamboat inspection laws.

These anchors are made of heavy canvas, heavily roped and fitted with wrought iron ring. A sea anchor should be on every boat that is liable to be caught out in a blow. Their value cannot be overestimated.

Diam. Inches	Length Inches	For Boat Length, Ft.
18	42	20
24	48	22
30	54	25
36	60	30 to 35
42	66	36 to 40
48	72	41 to 50

LIFE PRESERVERS

New Style

The New Style Life Preserver is made from solid cork with kapoc collar attached. Sizes of New Life Preserver made in accordance with the U. S. steamboat inspection regulations.

Prices on application.

MEDICINE CHESTS

The Upson-Walton Emergency Chest and the Wilson Emergency Chest are in general use on all steamers on the Great Lakes. They are carried in stock by us at all times. Other special cases can be supplied on request. Also complete medical and surgical equipment in accordance with the U. S. Marine Hospital Service. Prices and descriptions on application.

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LIFE BOATS

Built under the approval of the U. S. Board Supervising Inspectors of Steam Vessels.

Constructed with steel keels and independent air tanks to meet the latest requirement of inspectors.

Size Feet	Length Over All Ft. In.	Length Between Ring Bolts Ft. In.	Beam Ft. In.	Depth Ft. In.	Cubic Feet	Weight with Equipment Approx. Lbs.	Capacity Persons
10	10- 8	9- 6	4 ..	1- 6	36	250	3
12	12- 6	11- 6	4- 4	1-11	60	400	6
14	14- 6	13- 6	5 ..	2 ..	84	500	8
14	14- 6	13- 6	5 ..	2- 2	91	600	9
16	16- 6	15- 6	5 ..	2- 1	100	700	10
16	16- 6	15- 6	5- 8	2- 4	125	800	12
18	18- 7	17- 6	5- 8	2- 4	142	900	14
20	20- 7	19- 6	6 ..	2- 6	180	1200	18
20	.. ..	.. ..	6- 6	2- 8	202	....	..
22	22- 7	21- 6	6 ..	2- 7	204	1500	20
22	.. ..	.. ..	6- 6	2-10	242	....	..
24	24- 8	23- 6	7-10	3- 4	375	1300	37
26	26- 8	25- 6	7- 9	3- 4	401	2600	40
28	28- 8	27- 6	8- 4	3- 7	501	3200	50
30	30-10	29- 9	9 ..	3 ..	606	3900	60

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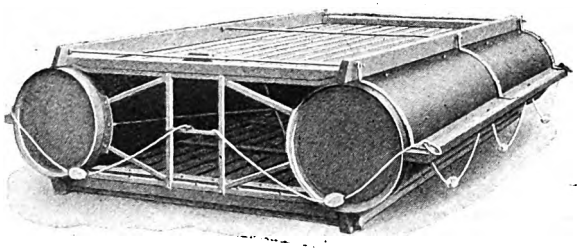
LIFE RAFTS AND BUOYS

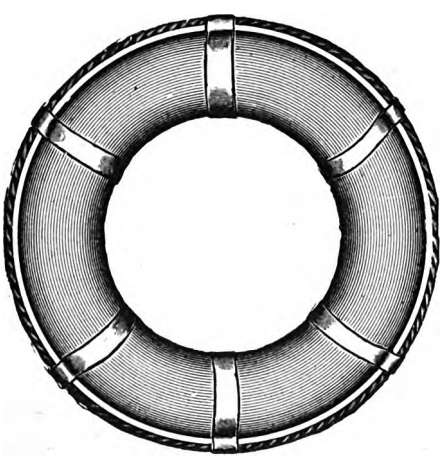
PONTOON CYLINDER LIFE RAFTS



Approved by the United States Board of Supervising Inspectors of Steam Vessels. Each raft is furnished with oars, oarlocks, life lines and buoys.

Prices on application.

Length Ft. In.	Beam Ft.	Diameter Cylinder In.	Cubic Ft.	Square Ft.	Capacity Persons: Ocean	Capacity Persons: Lakes Bays Sounds	Weight with Equipment Approx. Lbs.
17-6	9	22	87	106	22	29	1600
13-6	8	22	69	68	17	22	1400
11-4	8	22	58	56	14	18	1200
11-4	7	22	58	46	11	15	1000
9-4	7	22	46	39	..	12	700
7-4	5	16	19	15	..	5	400



RING BUOYS

Outside Diameter	Consolidated Cork	Solid Cork
15 in.	$1.80	$3.50
17 in.	2.00	3.75
19 in.	2.25	4.00
21 in.	2.50	4.50
24 in.	2.80	5.00
27 in.	3.20	5.75

Painted with two coats of paint and lettered in black, 15 to 21 in., $2.00 each; larger sizes, $3.00. Gold letters, double above prices.

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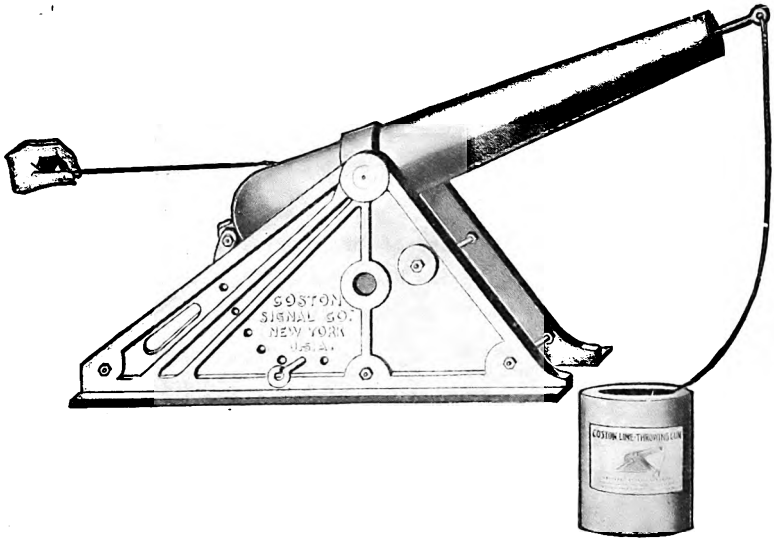
LYLE LINE THROWING GUN.

Approved by the U. S. Board of Steamboat Inspectors



Specifications

The gun is of forged steel, mounted on a steel carriage. The length of bore is 27 inches and diameter of same is 2½ inches.

The projectiles weigh eighteen pounds, and are turned to within a sixty-fourth inch of the bore.

The lines are 1700 feet long and exceed all official requirements. Lines have a breaking strength of over 500 pounds.

Attention is called to the following official report by the United States Steamboat Inspection Service as to distances attained in recent tests, using $\frac{3}{16}$ inch 4 strand 64 thread glazed linen line from drum.

Gun	Charge	Projectile	Elevation	Distance in Feet
824	8½ oz.	18¼ lbs.	30°	1705
825	8½ oz.	18¼ lbs.	30°	1805
826	8 oz.	18¼ lbs.	28°	1745
829	8½ oz.	18¼ lbs.	30°	1765

Gun with complete equipment.....**$175.00**

Extra lines and projectiles.....Prices on application

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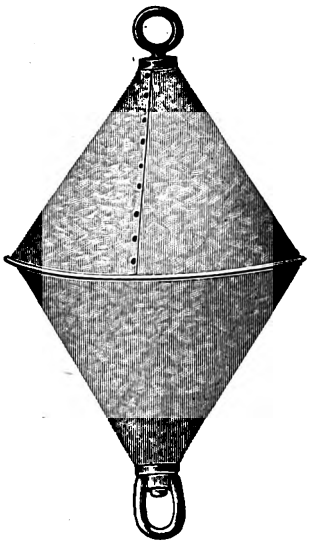
BUOYS

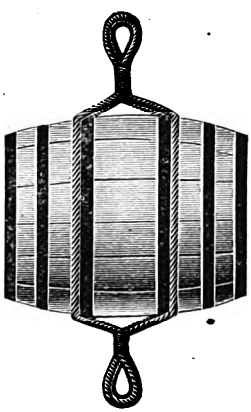
MOORING BUOYS



Galvanized iron with rod through center.

Size, in.	16x24	20x30	24x36	30x36
Each	$....	....	....	....

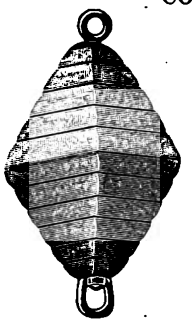
KEG MOORING BUOYS



Selected oak kegs securely bound with wire rope.

Nos.	1	2	3
Bbls.	⅛	¼	½
Each	$....	....	....

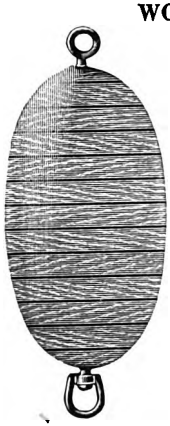
CORK BUOYS



Made of block cork with galvanized rod and swivel.

Size, In.	Each
6x6x12	$....
8x8x16	....
12x12x24	....
16x16x30	....

WOODEN BUOYS



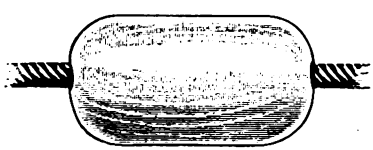
Built up of layers of selected white wood with galvanized rod and swivel.

....$....

SEINE FLOATS

Size, in.	2x2½	2½x3	3x4
Cedar per 100	$....	....	....
Cork per 100	....	....	....

LIFE BOAT FLOATS



Size, in.	....	....
Cedar per 100	$....	....	....

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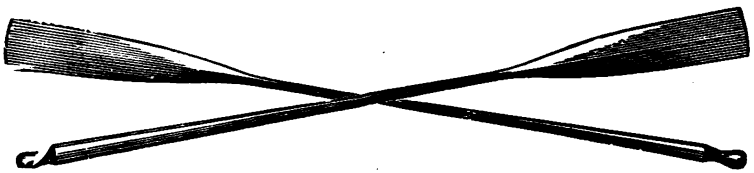
OARS, PADDLES, ETC.

OARS



Length, feet	6 to 10	12 to 13	14	15	16	18	20
Ash, plain, per ft	$....	....	....	....	....	....	....
Ash, copper tip, per ft	....	....	....	....	....	....	....
Spruce, 7 to 9 feet	per ft., ...						
Leathering oars	extra, per pair, .75						

CANOE PADDLES

Single

Length 4 to 6 feet, spruce, maple or ash ..... each, $1.50

We carry in stock paddles with 8 in. blade

Double

Selected spruce, copper tipped and varnished

Nickel plated ferrules, length 8 to 9½ feet ..... each, $....

FLAG POLES

Length, feet	3	4	5	6	8	10	12	14	16
Launch, polished	$0.40	.50	.60	.80	..	..	..	..	..
Regular, ash	$...	..	..	..	..	..	..	..	..

For Balls, Trucks and Cleats see index

ASH PIKE POLES

Length	feet, 5 to 10	12 to 16	18	20	24	30
Price	per foot, $0.08	.10	.12	.16	.25	..

BOAT HOOK HANDLES

Ends turned to fit boat hooks

Length, feet	5	5	6	6	7	7	8	10
Diameter, inches	1	1¼	1¼	1½	1¼	1½	1½	1½
Per dozen	$3.00	3.00	3.25	4.25	4.00	4.75	6.00	7.25

CAPSTAN BARS

Length feet	4½	5	6	8
Each	$0.54	.60	.72	.96

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SHIP'S LADDERS

Wood Sides Iron Rungs

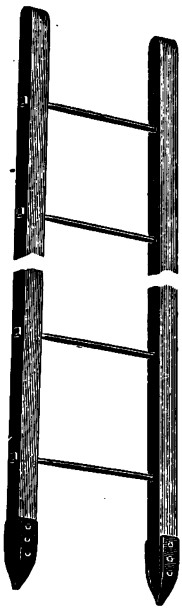

Fig. 1

Wire or Manila Rope Sides Oak Steps

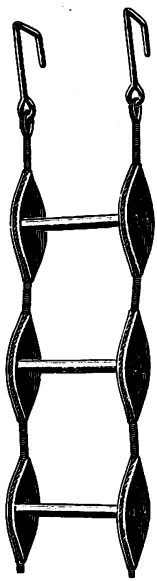

Fig. 2

New Pattern Companion Ladder

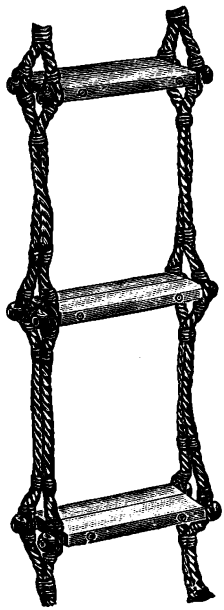

Fig. 3

Rope Ladder Hickory Rungs

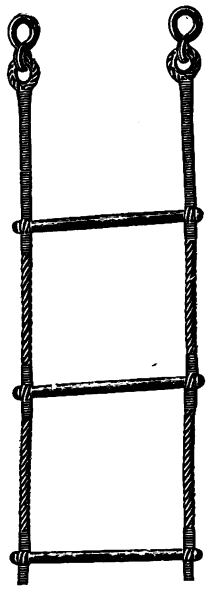

Fig. 4

Knotted Rope

Fig. 5

WOODEN SIDES, IRON RUNGS AND SPURS

Length, feet	12	14	16	18	20	22	24	26	28	30
Fig. 1.....each,	$9.60	11.20	12.80	14.40	16.00	17.60	19.20	20.80	22.40	24.00

22 feet and shorter are clear white oak; 24 feet and longer of Oregon fir.

COMPANION LADDERS, OAK STEPS

Length, feet	6	8	10	12	14	16	18	20	24	26	30
Fig. 2, wire rope...ea.,	$15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	60.00	65.00	75.00
Fig. 2, manila rope, ea.,	13.80	18.40	23.00	27.60	32.20	36.80	41.40	46.00	55.20	59.80	69.00

NEW PATTERN COMPANION LADDER

Length, feet	6	8	10	12	14	16	18	20	24	26	30
Fig. 3, manila rope....	$13.80	18.40	23.00	27.60	32.20	36.80	41.40	46.00	55.20	59.80	69.00

ROPE LADDERS WITH HICKORY RUNGS

Length, feet	6	8	10	12	14	16	18	20	22
Fig. 4 .....each,	$7.20	9.60	12.00	14.40	16.80	19.20	21.60	24.00	26.40
Length, feet	24	26	28	30	32	34	36	38	40
Fig. 4	$28.80	31.20	33.60	36.00	38.40	40.80	43.20	45.60	48.00

Other lengths at proportionate prices, ladders over 20 feet made in two sections at same price.

KNOTTED ROPE FIRE ESCAPES

Knots 20 in. apart, match hooks and thimbles in end

Length, feet	20	30	40	50
Number of knots.....	12	18	24	36
Fig. 5 .....each,.	$6.00	9.00	12.00	18.00

Other lengths at proportionate prices

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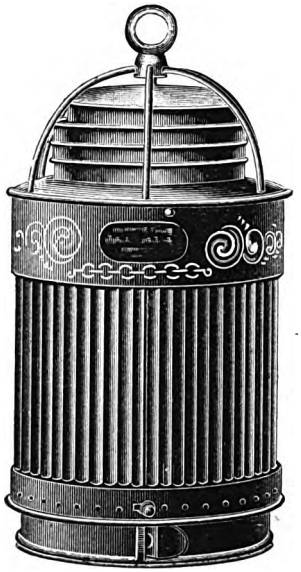
MARINE LAMPS

FLUTED LENS STEAMER SIGNALS



Planished Brass

Steamer signal lamps in sets of three, ruby, green and white.

8 in., steamer or tug	per set,	$64.00
10 in., steamer	per set,	84.00
8 in., headlight, white	each,	24.00
10 in., headlight, white	each,	32.00
8 in., side lights, red or gr.	each,	20.00
10 in., side lights, red or gr.	each,	27.00
8 in. guards	add,	5.00
10 in. guards	add,	6.00

Galvanized Iron

Steamer signal lamps in sets of three, ruby, green and white.

8 in., steamer or tug	per set,	$43.00
10 in., steamer	per set,	55.00
8 in., headlight, white	each,	18.00
10 in., headlight, white	each,	21.00
8 in., side lights, red or gr.	each,	13.00
10 in., side lights, red or gr.	each,	18.00

Japanned Tin

Heavy tin, japanned, same price as galvanized iron.

FLUTED LENS SIDE LIGHTS

Planished Brass

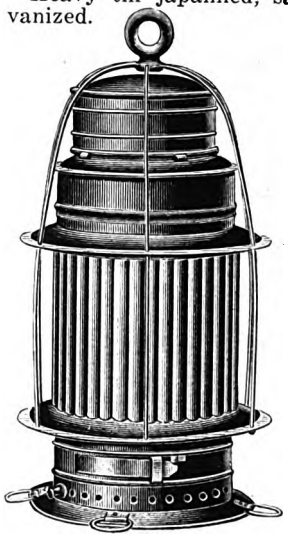
8 in. red and green	per pair,	$38.00
10 in. red and green	per pair,	50.00
8 in. guards	add,	3.00
10 in. guards	add,	4.00

Galvanized Iron

8 in. red and green	per pair,	$25.00
10 in. red and green	per pair,	32.00

Japanned Tin

Heavy tin japanned, same price as galvanized.



FLUTED LENS ANCHOR LIGHTS

Government size, 8 inch.

Brass

	Each
White	$22.00
Green	24.00
Ruby	27.00

Galvanized

White	$12.00
Green	14.00
Ruby	17.00

Japanned Tin

White	$12.00

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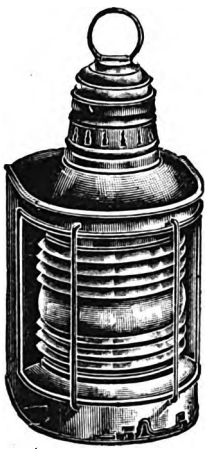
MARINE LAMPS

BOW OR HEADLIGHT

Fresnal or Triplex Lens



No.	Glass	Galv.	Pol. Brass
12	4¾ x 4¼	$ 5.00	$ 6.75
13	5 x 5	5.25	9.00
14	6 x 6	5.75	9.50
15	6¾ x 6¾	6.00	10.00
16	9 x 8	12.00	16.00

Nos. 12 and 13 regularly furnished with spring founts, extra charge for hinge bottoms.

STERN OR ANCHOR LIGHT

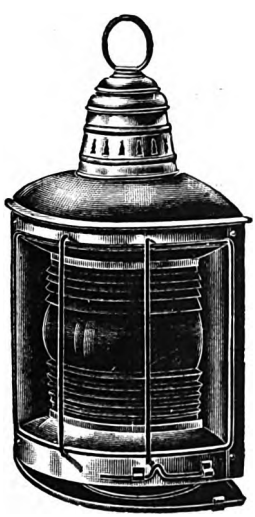
Fresnal or Triplex Lens

White Globes

No.	Glass	Galv.	Pol. Brass
21	4¾ x 4¼	$ 3.00	$ 5.00
22	6 x 5¾	5.25	10.00
23	8½ x 7	10.50	15.00

Ruby Globes

21	4¾ x 4¼	$....	$....
22	6 x 5¾	....	....
23	8½ x 7	....	....



SIDE LIGHTS

Fresnal or Triplex Lens

No.	Size Glass	Galv. Per Pair	Pol. Brass Per Pair
6	4¼ x 4¼	$ 6.50	$ 9.50
7	5½ x 5½	6.75	9.75
8	5¾ x 4¾	7.00	11.00
9	6½ x 5¾	9.00	16.00
10	6¾ x 6¾	10.50	18.00
11	10 x 7½	21.00	30.00

Nos. 6 and 7 regularly furnished with spring founts. Extra charge for hinge bottoms.

We carry in stock lights for every size vessel.

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MARINE LAMPS

SIDE LIGHTS

Fresnal or Triplex Lens

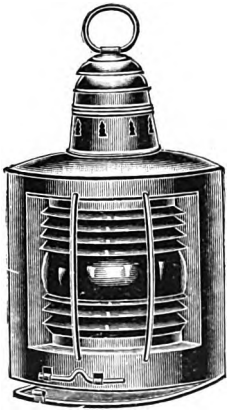
Class 2

Spring Founts

16 square inches required

Size Glass	No. Sq. Inches	Galvanized Per Pair	Brass Per Pair
4x5	20	$6.50	$9.50
Hinge bottoms, extra		.10	.20

Class 3



Spring Founts

25 square inches required

Size Glass	No. Sq. Inches	Galvanized Per Pair	Brass Per Pair
5¾x5¼	30	$6.75	$9.75
Hinge bottoms, extra		.10	.20

BOW LIGHTS

Fresnal or Triplex Lens

Class 2

Spring Founts

19 square inches required

Size Glass	No. Sq. Inches	Galvanized Each	Brass Each
4x7½	30	$5.00	$6.75
Hinge bottoms, extra		.05	.10

Class 3

Spring Founts

31 square inches required

Size Glass	No. Sq. Inches	Galvanized Each	Brass Each
4½x7¾	35	$5.25	$9.00
Hinge bottoms, extra		.05	.10

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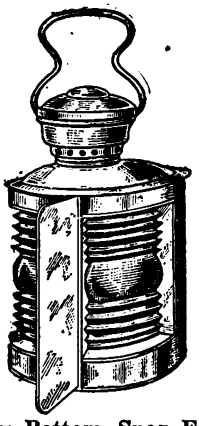
MARINE LAMPS

COMBINATION LIGHTS

Fresnal or Triplex Lens



Hinge Bottom, Snap Fount

Height Inches	Glass Inches	Galv. Each	Brass Each
8½	3¼x4	$7.90	$9.75

MIDGET SAILING LIGHTS

Fresnal or Triplex Lens

For small motor boats and sail boats.

Height Inches	Glass Inches	Galv. Each	Brass Each
8½	3¼x5	$3.00	$4.00

STERN AND ANCHOR LIGHTS

Fresnal or Triplex Lens

Class I

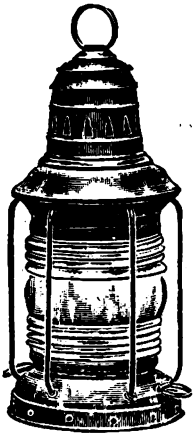
Screw Fount, Clear Glass

Height Inches	Glass Inches	Galv. Each	Brass Each
8¾	3½x3	$2.50	$4.00

With Ruby Globes

Fresnal or Triplex.....	$3.50	$5.00
Plain	2.50	4.00

Class 2 or 3



Screw Fount, Clear Glass

Height Inches	Glass Inches	Galv. Each	Brass Each
14	4¾x4¼	$3.00	$5.00
With ruby globe.....		4.50	6.50

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MARINE LAMPS

NORWEGIAN REGULATION LIGHTS

Made with Norway tops, using American burners and chimneys, and guaranteed to pass any Norwegian or German control office inspection.

MAST HEAD LIGHTS

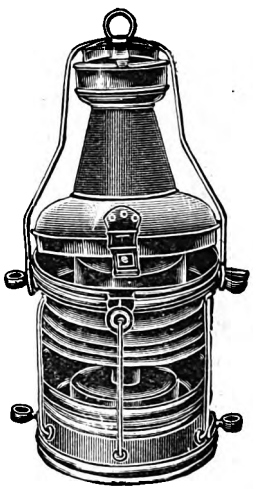
Fresnal Lens

Two-third section 7½x10 inches

Galvanized iron .....each, $35.00
Copper .....each, 45.00

ANCHOR LIGHTS

Fresnal Lens



Whole cylinder 7½x10 inches

Galvanized iron .....each, $28.00
Copper .....each, 38.00

SIDE LIGHTS

Fresnal lens and extra fine shade glass which is placed back of each side light as to color required by law.

Glass 7½x10 inches

Galvanized iron .....per pair, $40.00
Copper .....per pair, 75.00

STERN LIGHTS

One-third section glass

Galvanized iron .....each, $30.00
Copper .....each, 40.00

All above lights can be furnished combination oil and electric at $5.00 each, extra.

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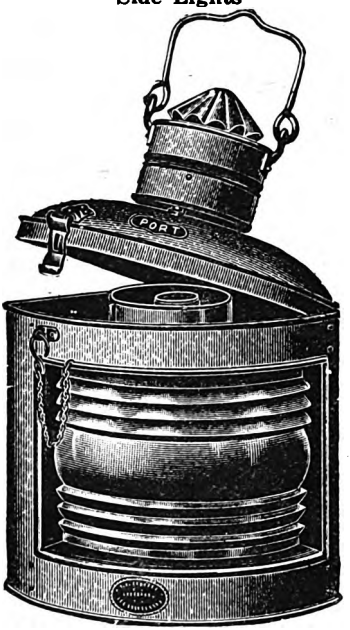
MARINE LAMPS

ENGLISH REGULATION LIGHTS

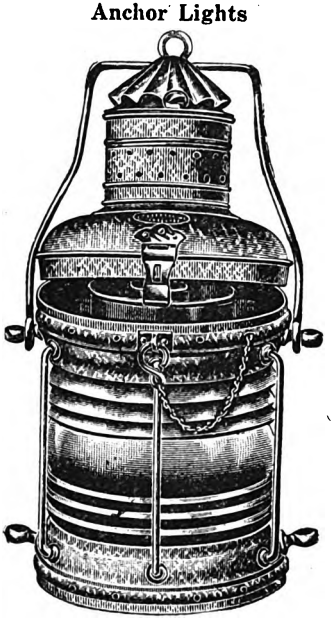
These improved lights are guaranteed to meet all requirements of the British Board of Trade.

Side Lights



Mast Head Lights

Anchor Lights



Side Lights, Fresnal Lens

Glass 7½x10 inches

Galvanized iron	per pair,	$40.00
Copper	per pair,	75.00
Extra glass slides, red or green,	each,	2.50

Anchor Lights, Fresnal Lens

Glass 7½x10 inches

Galvanized iron	each,	$28.00
Copper	each,	38.00

Mast Head Lights, Fresnal Lens

Glass, two-third section, 7½x10 inches

Galvanized iron	each,	$35.00
Copper	each,	45.00

All above lights can be furnished combination oil and electric at $5.00 each, extra.

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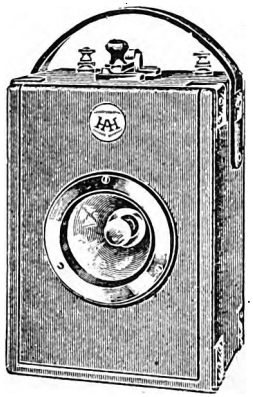
MARINE LAMPS

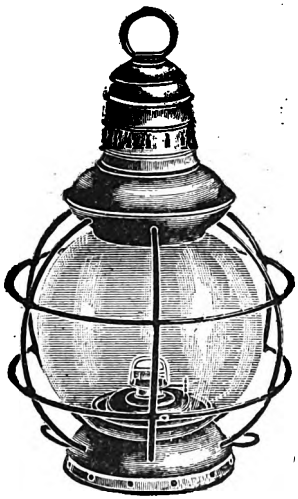
MORSALITE ELECTRIC TELEGRAPH LAMP



Electric hand lamp with Morse tapper.

Complete .....$....
Extra batteries ....
Extra bulbs ....

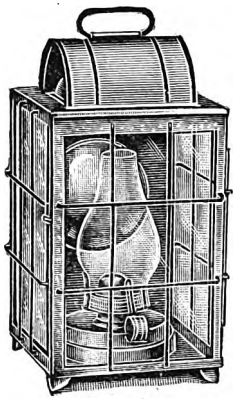
GLOBE LIGHTS



With Regular Round Globes

Diam. of Glass Inches	White Globes Galv. Per Doz.	White Globes Brass Per Doz.	Ruby or Green Globes Galv. Per Doz.	Ruby or Green Globes Brass Per Doz.
6	$24.00	48.00	32.00	56.00
8	30.00	60.00	40.00	70.00
10	90.00	135.00	105.00	150.00
With Squat Globes				
10	105.00	150.00	130.00	175.00

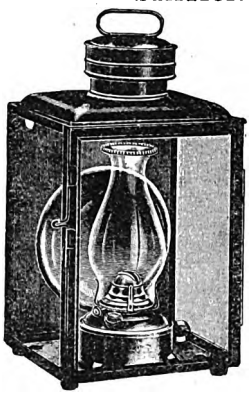
BULKHEAD LAMPS



Extra heavy galvanized iron and brass. Glasses slide in from outside. Reinforced guards.

Size Inches	Galv. Per Doz.	Brass Per Doz.
8x12	$45.00	90.00
10x14	55.00	100.00

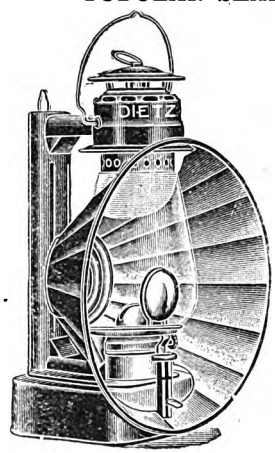
STATION LAMPS



Japanned tin or galvanized. Cold blast system, outside ratchet stem.

Size Inches	Jap. Per Doz.	Galv. Per Doz.
8x12	$20.50	43.00
10x14	27.00	53.00

TUBULAR SEARCHLIGHTS



Enameled tin, cold blast.

Nos.	30	60
Burner No.	262	323
Wick, in.	1	1½
Globe	0	2
Each	$....	....

No. 30 has bulls-eye lens, No. 60 has 5 in. reflector.

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MARINE LAMPS

BINNACLE LAMPS

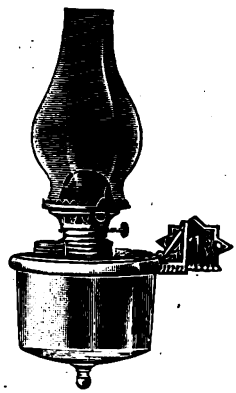
Half Oval

No.	1	2
Size glass, in.	2¾x4	3x4½
Height, in.	7⅛	8½
Width, in.	3½	4¼
Brass ....each,	$2.50	$3.00

Round

No.	Diam. In.	Height In.	Each
1	2¼	5½	$2.50
2	3	6½	3.00

STIFF BRACKET LAMPS



Polished brass. Detachable fount fitted with No. 2 hinge burner.

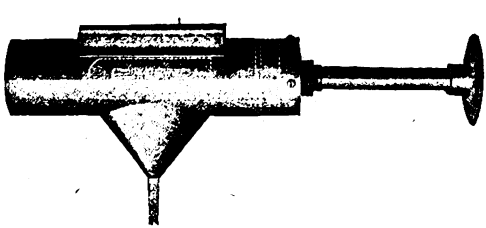
Projection, in.	8
Height, in.	12
Each	$4.00
With smoke bell and bracket	6.00

HURRICANE LAMPS

High bronze finish. Made of heavy spun brass, strong and suitable for exposed places. Oil well, burner and chimney are held in place by spring catches, guaranteed not to flicker or blow out.

No. 234 Globe 7 inches, height 19 inches ....each, $....

TELLTALE BINNACLE LAMPS



Fits inside of square Pilot House Binnacle. Throws a single concentrated beam of light on lubber point of compass. In ordering, give inside width of binnacle head and voltage of ship's lighting circuit.

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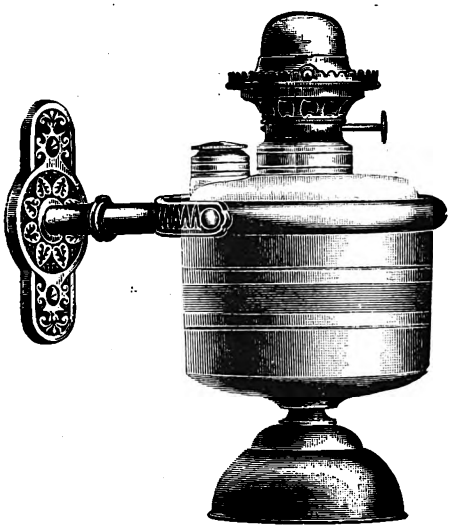
MARINE LAMPS

CABIN SWING LAMPS



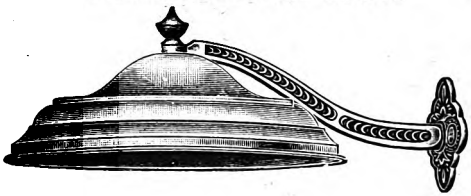
No. 72 Oxidized brass, detachable fount, complete with burner and chimney .....each, $5.00

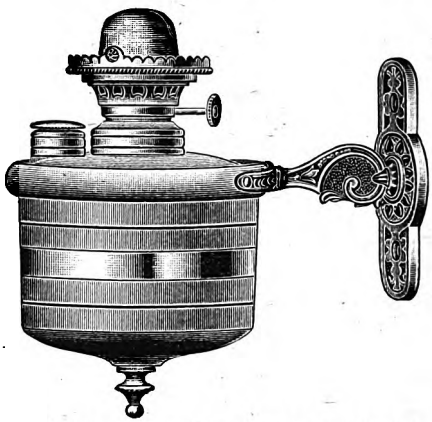
CABIN SWING LAMPS

Polished brass, with gimbals; complete with chimney and burner. Can be used as table lamp or hung on wall.

Nos.	1	2
Each	$2.25	3.00

BRACKET MARINE LAMPS



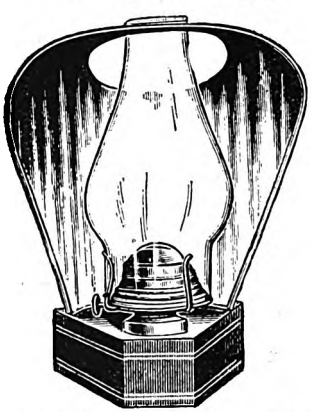


With brass removable fount, finished in gilt and dark steel. Smoke bell dark steel. Has feeder for filling. Projection 8 in.

No. 09 With No. 2 (B) collar brass fount, without burner or smoke bell, ...per doz., $66.00

Smoke bell and holder..... ....

TIN WALL LAMPS



Triangle base, japanned....per doz., $10.50

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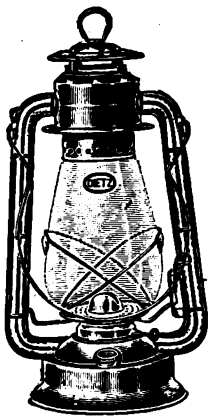
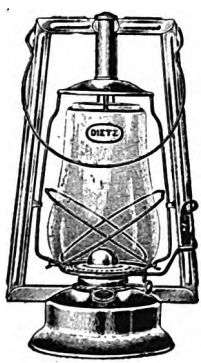
LANTERNS



No. 2 COLD BLAST LANTERNS

Light efficiency, 10 candle power, fount capacity 20 hours, No. 2 tinned steel burner and cone, large brass oil filler, 1 in. wick, No. 2 C.B. selected globe. Bright tin finish.

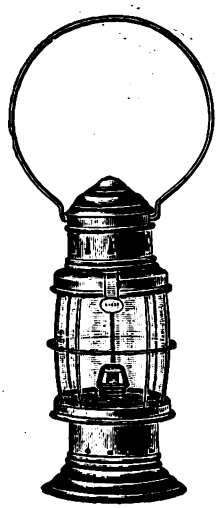
Per doz. .....$....



No. 0 HOT BLAST LANTERNS

Light efficiency 4 candle power, fount capacity 18 hours, No. 1 tinned steel burner and cone, large brass oil filler, ⅝ in. wick. No. 0 selected globe. Bright tin finish.

Per doz. .....$....



ENGINEERS' LANTERNS

Diameter of globe 3 inches, height of globe 4½ inches, height of frame 6¾ inches, extreme height 10 inches.

Galvanized ....per doz., $13.50

Brass, per doz., 26.00

Brass with bulls-eye .per doz., 32.00

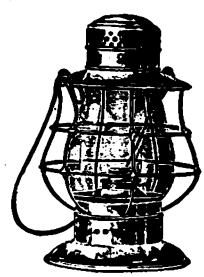
IMPROVED NAVY LANTERNS

Diameter of globe 5 inches. Height of globe 6½ inches, height of lantern 12 inches, diam. of base 5¾ inches. Heavy galvanized iron with hinge bottom and spring fount.

With white globe per doz. $15.75

With red globe per doz., 23.75

No. 6 R. R. LANTERN



Height over all 10 inches, volume of light 2 candle power. Burns lard oil. No. 6 globe, No. 2 ratchet burner, 1 inch wick.

Bright tin..doz., $....

DARK LANTERN

Height over all 8 in., volume of light 3 C. P., size of wick ⅝ in., fount capacity 16 hours, No. 1 ratchet burner, size of lens 3 in.

Japanned.doz., $15.00

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TORCHES AND HAND LAMPS

TORCHES

	Tin Per Doz.	Galv. Per Doz.
Cleveland pattern	$6.00	$5.50
Chicago pattern	5.00	6.50
Shield extra	3.00	3.00

PYRAMID TORCHES

No.	80	81	82	83
Capacity	½ pt.	1 pt.	1 qt.	1 qt.
Burners	1	1	1	2
Per doz.	$7.00	9.00	10.00	11.00
No.	84	85	86	87
Capacity	2 qt.	2 qt.	4 qt.	4 qt.
Burners	1	2	2	3 or 4
Per doz.	12.00	13.00	15.00	18.00

HAND LAMPS

Galvanized iron or tin, one pint.....
.....per gross, $18.00

HAND TORCHES

Made of heavy tin.

Nos.	2	3
Capacity, pts.	½	1
Per doz.	$4.00	4.50

HAND FLASHLIGHTS

Galvanized iron .....per doz., $18.00

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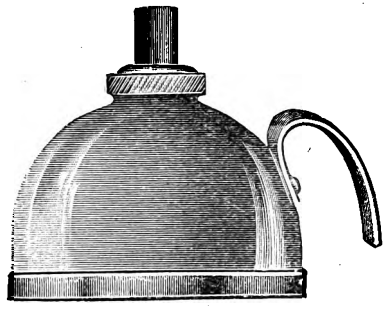
HAND LAMPS, BLOW TORCHES, ETC.

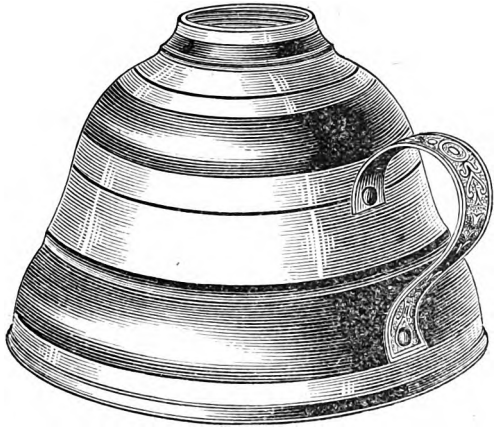
STEEL HAND LAMPS



Seamless cold rolled steel, copper plated. Will burn any kind of oil. Diameter at bottom 3⅜ in.; capacity 5 ounces.

No. 20.....per doz., $6.00

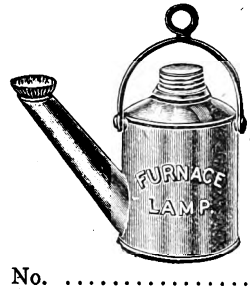
BRASS HAND LAMPS



This lamp is made of sheet brass; height 2¼ in., diameter of bottom 3¾ in. Very handy, serviceable and lasts a long time.

No. 2.....each, $....

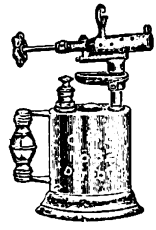
BUNKER LAMPS



Made in one casting and is practically indestructible.

No.	1	2
Capacity, pints	3	2
Per doz.	$9.00	7.50
Extra wicks .....per doz.,	.55	.30

BLOW TORCHES

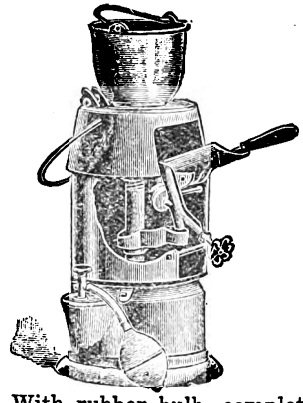


Produces a perfect blue flame indoors or out, in hard wind or extreme cold. Burner is improved type, with special generator chamber, superheating the gas before it is burned, and is made of special bronze metal which holds the heat. Tank is 18 gauge seamless drawn brass, fitted with patented automatic brass air pump.

Has hook and support on burner for holding soldering coppers.

No. 32 One quart .....each, $8.00
No. 38 One pint .....each, 7.20

GASOLINE FIRE POTS



A combined tinners' and plumbers' furnace that will heat a 6 lb. copper in four minutes and melt 10 lbs. of solder in eight minutes.

With rubber bulb, complete.....$14.00

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LAMP FOUNTS, REFLECTORS AND GLOBES

EXTRA FOUNTS

Without Burners

	Galv. Per Doz.	Brass Per Doz.
For combined light	$4.00	7.50
For midget light	6.75	7.50

For Side Lights

No.		
6	$4.00	7.00
7	4.00	7.00
8	6.00	9.00
9-10	8.00	12.00
11	12.00	18.00

For Anchor Lights

No.		
21	$6.00	9.00
21½	4.00	7.00
22	7.00	10.00
22½	8.00	12.00
23	12.00	18.00

Bow Lights

No.		
12	$4.00	7.00
13	4.00	7.00
14-15	8.00	12.00
16	12.00	18.00
Navy lanterns	4.00	7.00
Engineer lanterns	4.00	7.00

Price of founts for lights with door on application.

REFLECTORS

Nickel plated.

Size, in.	6	8
Per doz.	$6.00	9.00

FLUTED GLOBES AND SECTIONS

8 in. bow light	each,	$....
10 in. bow light	each,	....
8 in. side light, red or green	each,	....
10 in. side light, red or green	each,	....
8 in. anchor light, white	each,	....
8 in. anchor light, red	each,	....

RUBY SHADES

7½x10 in. for Norwegian lights. each, $....

FRESNAL LENSES

Whole Globes

No. Lamp	Size Inches	White Each	Red, Green or Blue Each
Stern	3 x3½	$0.75	1.25
21	4¾x4¼	1.00	2.00
21½	4½x4¾	1.25	2.50
22	6 x5½	1.80	3.25
22½	6 x6½	2.30	4.00
23	8½x7	3.50	6.50
English anchor, white only		each,	7.75

Side Light Sections

No. Lamp	Size Inches	Green Each	Ruby Each
Combined	3 x4	$1.00	1.50
Midget	3¼x5	1.00	1.50
6	4 x5	1.10	1.75
7	5¾x5¼	1.25	2.00
8	5¾x5¼	1.25	2.00
9	5¾x6½	1.60	2.25
10	6¾x6¾	2.25	3.00
11	7½x10	4.50	6.50
English side, white only		each,	5.00

Half Sections

No. Lamp	Size Inches	White Each	Red Green or Blue
Midget	3¼x5	$0.75	1.25
12	4 x7½	1.00	2.00
13	5 x7	1.40	2.40
14	6 x6	1.60	2.60
15	6¾x6¾	1.75	2.75
16	9 x8	2.75	4.50

English mast head, ⅔ section.....$7.75
English stern, ⅓ section..... 3.75

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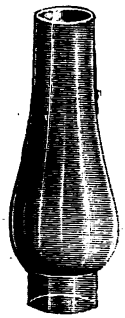
LAMP CHIMNEYS

Sun Bulb Plain Top

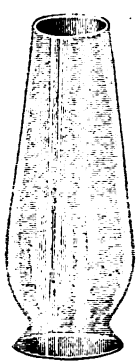


Nos.	0	1	2
Height, in.	6½	7½	8½
Diam. bulb, inches	3	3¼	4
Diam. at bottom, inches	2	2½	3
Per doz	$...	...	...

Sun Straight

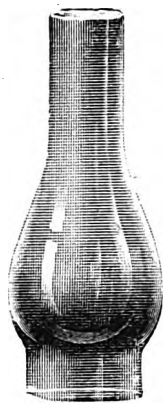
Nos.	0	1	2
Height, in.	6½	7½	8
Diam. top, inches	1¼	1½	1⅞
Diam. bottom, inches	2	2½	3
Per doz.	$...	...	...

Hinge, Plain Top



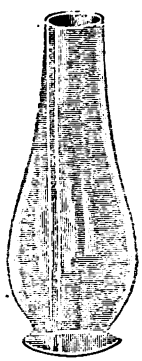
Nos.	1	2	3
Height, in.	7¼	8¼	10
Diam. bulb, inches	3¼	3¾	4⅜
Diam. top, inches	1½	1¾	2
Diam. at bottom, inches	2⅜	2⅝	3¼

Rochester



No.	2
Height, in.	10
Diam. bulb, in.	3⅝
Diam. top, in.	2
Diam. bottom, in.	2⅝
Per doz.	$....

Dual



Nos.	1	2
Height, in.	6	8
Diam. bulb, in.	3	3⅝
Diam. top, in	1½	1¾
Diam. bottom, in.	1⅝	2⅛
Per doz.	$...	...

Rayo

No.	2
Height, in.	10⅛
Diam. bulb, in.	3½
Diam. top, in.	1¾
Diam. bottom, in.	2 2/16
Per doz.	$....

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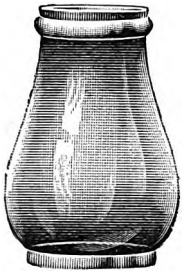
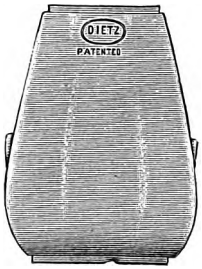
LANTERN GLOBES AND LAMP BURNERS

LANTERN GLOBES

No. 0, Tubular **No. 2, Cold Blast**



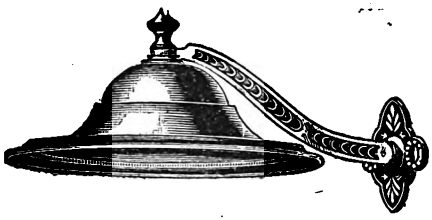


No. 0 White .....per doz., $....
No. 0 Ruby .....per doz., ...
No. 2 White .....per doz., ...
No. 2 Ruby .....per doz., ...

Fits All **No. 6 R. R.**

Fits All, white .....per doz., $....
Fits All, ruby .....per doz., ...
No. 6 R R, white .....per doz., ...
No. 6 R R, ruby .....per doz., ...

SMOKE BELLS



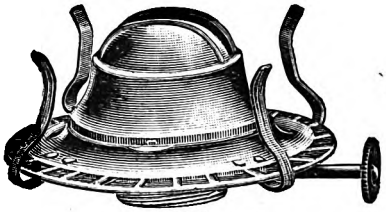
Polished Brass

Diameter 6 inches

With arm .....each, $0.60
Without arm .....each, .35

LAMP BURNERS

Sun



Plain

Nos.	0	1	2	
Size wick, in.....	⅜	⅝	1	
Per doz. .....$....	....	....		

Hinged

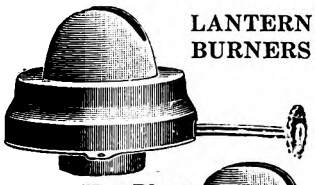
Nos.	0	1	2	3
Size wick, in.....	⅜	⅝	1	1½
Per doz. .....$....	....	....	....	

Duo

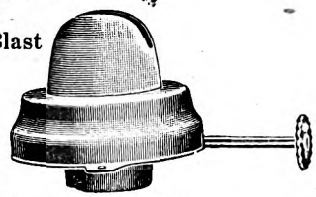
No.	2
Size wick, in.....	1

For 1 wick.....per doz., $....
For 2 wick.....per doz., ...

LANTERN BURNERS



No. 1, Hot Blast



No. 2, Cold Blast

No. 1 Hot blast .....per doz., $....
No. 2 Cold blast .....per doz., ...
No. 2 R R plain .....per doz. ....
No. 2 R R ratchet .....per doz., ...
No. 1 Simplex .....per doz., ...
No. 2 Simplex .....per doz., ...

WICKS

Flat

Nos.	0	1	2	3
Per doz. packages.$....	....	....	....	
Per doz. rolls....	....	....	....	

Rochester

No. 2.....per doz., $....
Rayo .....per doz., ...

TORCH WICKING

Braided, 16 lb. rolls.....per lb., $....

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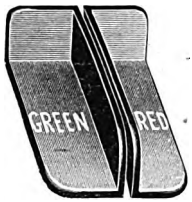
LAMP SCREENS AND DISTRESS SIGNALS

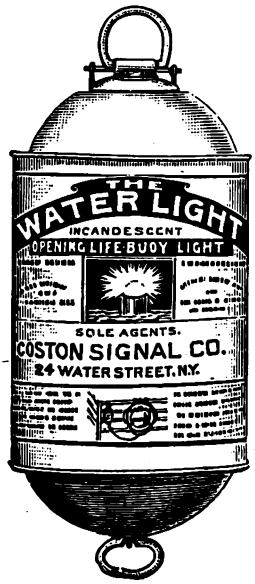
SIDE LIGHT BOXES OR LAMP SCREENS



Backs of boxes are painted drab color, insides are enameled in red and green.

For boats, class.....	2	3
Length, in.	18	24
Per pair .....$....		....

COSTON RESCUE WATER LIGHT



These water lights have proven invaluable in the event of collision at sea at night, as when thrown overboard they light up the damaged part of the vessel and show the extent of the injury.

They have also proven of great service when placed in a bucket of water and used as deck flares when other means of lighting have failed in disasters occurring at night. Many other uses are also found—such as locating buoys at night, etc.

Size 8x10 in. Weight 5½ lbs. 250 candle power. Burns 45 minutes.

Each $5.00

DISTRESS SIGNALS

For over seventy years Coston Night Signals have established a standard of excellence and reliability never approached by any competitor and have been officially adopted by the U. S. Government in all branches of its service and generally by the merchant marine of most countries.

Coston Night Signals embody all of the latest scientific improvements—burn in any color or combination of colors—with an intense brilliancy clearly discernible for over five miles at sea.

Coston Distress Outfits consist of twelve red signals, each capable of burning two minutes, properly packed in a metallic water-tight case, and are among the articles required by the U. S. Steamboat Inspection Service in the equipment of life-boats to enable those in the boats to signal for help during the night when they could not otherwise be seen by a passing vessel.

Signal color signals.....per doz., $3.00

Combination color signals...per doz., 4.00

Distress outfits for life-boats, 12 in a can .....each, 7.00

Distress outfits for life-rafts, 6 in a can .....each, 5.00

COSTON SHIP ROCKET

Coston rockets for calling help at sea are recognized for their absolute reliability and form part of the necessary equipment of many of the great ocean liners as well as having been adopted exclusively as standard signals by the leading yacht clubs, steamship lines, etc.

The Coston rockets rise to a height of over 400 feet and throw a shower of red balls that burn with great intensity and can be seen at a great distance.

Size, lbs.	1	2	4	6
Per doz.	$3.50	7.00	10.00	12.00

Galvanized magazine .....each, 3.00

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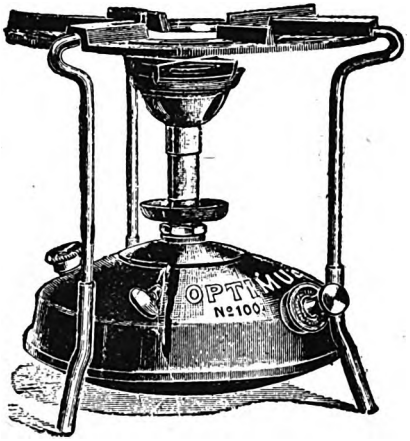
OIL STOVES AND RANGES

THE PETROLEUM GAS STOVE "OPTIMUS"

Wickless Blue Flame Oil Stoves



The petroleum gas stove "Optimus" No. 100 is in all parts a first class manufacture and is now the leading petroleum gas stove on the market.

The construction of the burner is very simple; there are no bent pipes, but only one simple rising-pipe. The burner is a combination of the roarer and noiseless burner. If the stove is used with burner plate No. 5 it will burn roaring and if with damper No. 3 it will burn without noise.

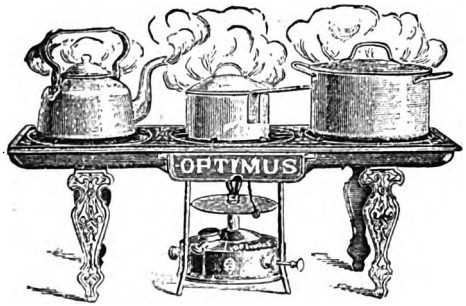
We supply the stove with the burner plate, and if a burner is required this has to be stated in the order. This stove can be taken apart and stored in very little space.

No. 100 With grating, 1 quart size.....$3.25

Parts for the above stove carried in stock.

THE "OPTIMUS" RANGE

With Wickless Blue Flame Oil Stoves



With only one Optimus Stove three kettles can be heated at the same time on the Optimus range. This range is thus very economical and particularly suitable for family use.

Each range is supplied with a protection plate, which should always be placed on the spirit cup to prevent the tank from overheating.

The range is accompanied by a complete set of rings and plates.

Price, without Optimus stove.....$4.30

Price, including Optimus stove..... 7.55

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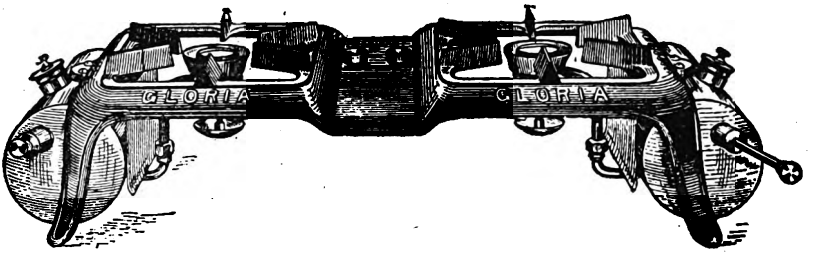
OIL RANGES AND ALCOHOL STOVES

THE "GLORIA" PETROLEUM RANGE

Wickless Blue Flame Oil Stoves



Two Burner

A perfect substitute for the gas range. Considerably cheaper to use than a gas range of corresponding size.

Burns without wick with a perfectly blue flame. No smoke. No soot. The flame can be regulated at will. On the "Gloria" No. 2 there is a separate regulator for each burner. No danger of explosion. Works perfectly, of great stability, economical in use, few spare parts. Extremely easy to manage. The burners do not clog up and are very easy to keep in order.

The same nipple and same cleaning needle as those furnished with the ordinary petroleum stove.

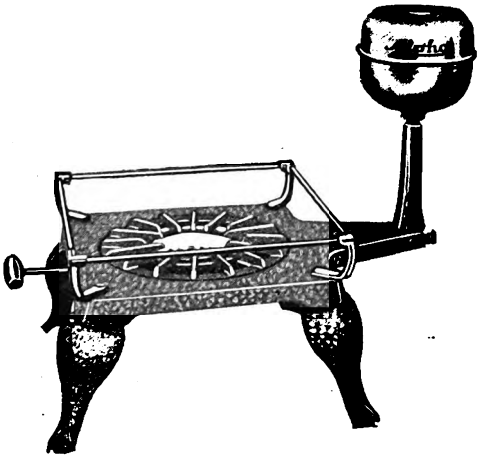
One quart of water can be brought to boil in 4 minutes.

This range is considerably more attractive and durable than the ordinary stove.

The frame is made of cast iron and the rest of highly polished brass.

	One Burner	Two Burners
Price, complete	$4.55	$9.15
Price of the frame alone	1.00	2.00

ALCOHOL MARINE STOVE



Suitable for general cooking on boats, yachts and vessels of all kinds. Frame made of gray iron casting, heavily galvanized to stand wear and weather.

Fitted with brass rail to keep utensils from being displaced. The front rail may be removed when desired. Has a powerful burner and will accommodate an oven. The legs can be screwed down. Handsomely finished throughout.

Capacity of tank, 1 quart. Will burn from three to five hours. Space occupied when set up for use, 13 inches wide, 19 inches deep, 15⅝ inches high. Weight, 11½ pounds. Packed, ready to ship, 17 pounds.

One burner, galvanized finish.....$5.50

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ELECTRIC LAMPS

HOLOPHANE DOME LAMP

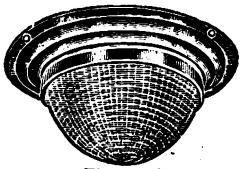


Fig. 1533

This dome is nicely finished, wired complete in either brass or nickel finish. with candelabra socket.

Size Glass	Each
3 in., less bulb	$2.25
4 in., less bulb	2.50
5 in., less bulb	3.00

FROSTED DOME LAMP

Fig. 1534

Fittings of this dome are same as Fig. 1533 but furnished with a shallow clear or frosted glass.

Size Glass	Each
3 in., less bulb	$2.25
4 in., less bulb	2.50

CUT STAR DOME LAMP

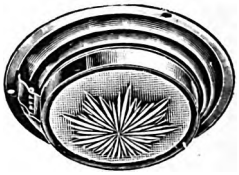


Fig. 1535

This dome is same as Fig. 1533 but furnished with a cut star glass.

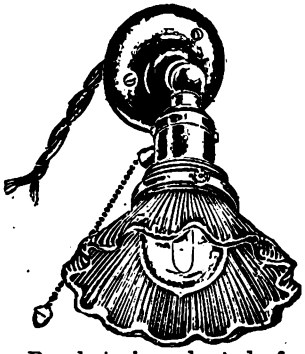
Size Glass	Each
3 in., less bulb	$2.50
4 in., less bulb	3.00

WALL FIXTURES

Wired Ready for Use

Wired complete with either candelabra or Ediswan socket.

Candelabra, less bulb. $1.00
Ediswan, less bulb.... 1.10

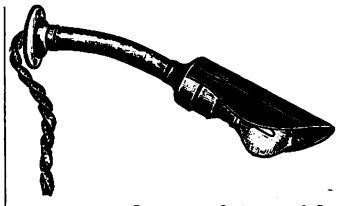


Bracket is adapted for both auto and motor boat. Wired complete with candelabra pull socket.

Price, less bulb.....$2.50

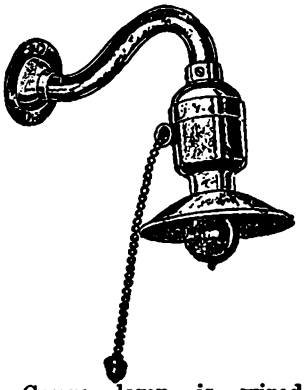
Gauge lamp is ready for use. Complete with candelabra pull chain socket.

Price, less bulb.....$1.75



Wired complete with either candelabra or Ediswan socket.

Candelabra, less bulb. $1.10
Ediswan, less bulb.... 1.20



Gauge lamp is wired ready for use. Complete with pull chain socket.

Price, less bulb.....$2.00

The above are furnished either in brass, nickel or black.

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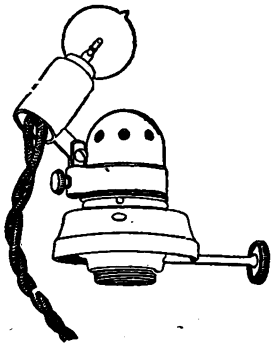
LAMP ADAPTERS AND SPARK PLUGS

ADJUSTABLE CANDELABRA LAMP ADAPTER



Adapter is made with candelabra socket for either oil or gas lamps.

Oil lamp $0.50
Gas lamp ..... .50

ADJUSTABLE EDISWAN LAMP ADAPTER

Adapter is made with Ediswan socket for either oil or gas lamps.

Oil lamp $0.65
Gas lamp ..... .65

MINIATURE TO CANDELABRA ADAPTER

Price $0.05

SPARK PLUGS

Splitdorf Plugs

One of the most durable spark plugs made. Has mica insulation, can be easily cleaned but requires very little attention.

½ in. regular....each, $1.00

Mosler Vesuvius Spark Plug

A stone insulated plug. It is practically everlasting and will outwear the engine itself without deteriorating in service. The continuous knife edge electrode gives a ribbon of flame exploding all the gas and developing all the power of the motor.

½ in. regular....each, $1.00

Champion Conical Plug

Adapted for all gasoline motors using a ½ inch plug. The most popular plug on the market.

½ in. .....each, $1.00
Extra cores .....each, .50

A. C. Cico Plug

A thoroughly tested low priced plug. The very best that can be made for the price.

½ in. regular....each, $0.75

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ELECTRIC SEARCHLIGHTS

GRETHER PORTABLE ELECTRIC SEARCHLIGHTS

Style No. 4

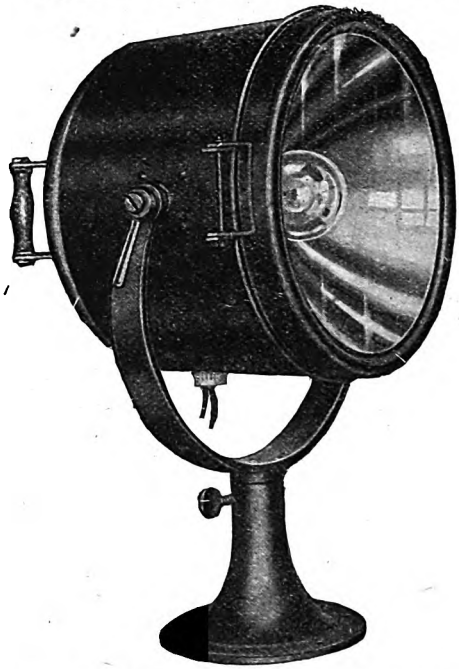
Style No. 5

For lake and river craft, ocean going vessels, night landings, locating channel marks, loading and unloading, inspection, etc.

No. 4 A medium priced searchlight answering all ordinary requirements .....each, $20.00

No. 5 Our best type for heavy service with highly perfected ventilating system and improved front..each, 30.00

"GOLDEN GLOW" SEARCHLIGHTS



The searchlight illustrated above is fitted with a 12-inch "Golden Glow" reflector.

These famous "Golden Glow" reflectors are moulded from a special glass of a greenish-yellow color. They are accurately ground and polished to true parabolic form by a special patented process. They are the most highly developed reflectors on the market. They alter the light in color by subtracting the violet and blue rays, thus projecting a beam of light of a beautiful golden color or "Golden Glow" light.

"Golden Glow" light is non-blinding and wonderfully adapted to fog penetration. With them installed it is possible to cruise, day or night through dense atmospheres with maximum safety, it being possible to distinguish docks, channel buoys, stakes and other craft at a much greater distance than is possible with a white light.

The case of the Type DDB-128 searchlight is made entirely of steel. It is finished inside and out in black baked enamel.

Type DDB-128 .....each, $....

For extra wires, fittings, etc., for "Golden Glow" searchlights, write for prices.

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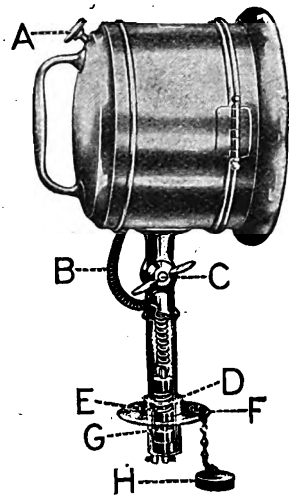
ELECTRIC SEARCHLIGHTS

CELLO WIRELESS



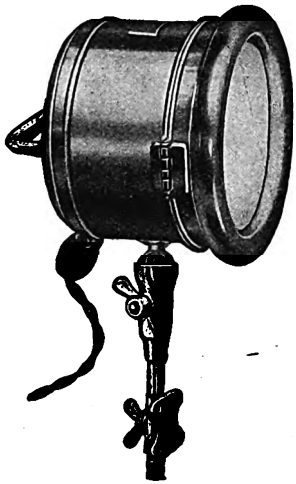
Operates on 6 Dry Cells, 6V-Storage or Direct Current Magneto. Throws Light 800 to 1000 Feet

This is an entirely new light embodying all the good features of the well known Cello searchlights and several new ideas. It is of special construction throughout. No wires to connect after installing. No loose wires. Light makes its own positive connection when placed in deck socket. Cap screwed on makes deck socket absolutely waterproof.

Polished brass or nickel finish.

Price .....$....

SPECIAL FOR MOTOR BOATS



Deck Type

Fitted with high grade 5 inch metal reflector and lens, with revolving bracket and base. Height over all, 10½ inches.

Furnished complete with Ediswan base and Tungsten electric bulb. One of the handiest lights around the water for picking out mooring places and other objects for several hundred feet distant. Made of extra heavy brass, all joints being watertight.

Can be operated from magneto or 4 dry batteries as only 6 volts are required.

Price, complete .....$....

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LAMP SOCKETS AND BULBS

LAMP SOCKETS

Key Socket **Keyless Socket**

No. 59480 Key, ⅛ in. cap.....each, $0.33
No. 59482 Keyless, ⅛ in. cap, each, .30

Pull Sockets **Weather Proof Sockets**

No. 65250 Pull chain, ⅛ in. cap.....
.....each, $0.60

No. 43310 Weather proof, 600 volts, with 6 in. No. 14 wire.....each, .49

ATTACHMENT PLUGS

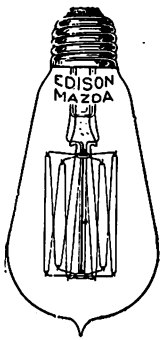
Weather Proof **Benjamin**

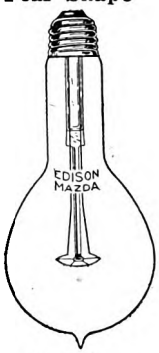
No. 345 Moulded weather proof.....
.....each, $0.44

No. 903 Benjamin swivel .....each, .40

MAZDA LAMPS

Straight Side **Pear Shape**





Straight Side Mazda B

Watts	Type Bulb	Base	Clear	Frosted
		110 to 125 Volts		
15	S17	Medium	$0.35	$0.38
25	S17	Medium	.35	.38
40	S19	Medium	.35	.38
60	S21	Medium	.40	.45
		220 to 250 Volts		
25	S19	Medium	$0.40	$0.43
50	S19	Medium	.40	.43
100	S30	Skirted	1.00	1.07
150	S35	Skirted	1.50	1.60
250	S40	Skirted	2.50	2.65

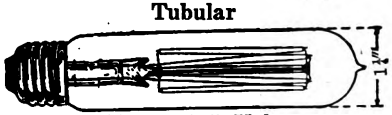
Pear Shape Mazda C

		110 to 125 Volts		
75	PS22	Medium	$0.70	$0.75
100	PS25	Medium	1.10	1.15
150	PS25	Medium	1.65	1.70
200	PS30	Medium	2.20	2.27
		220 to 250 Volts		
200	PS30	Medium	$2.40	$2.47
300	PS35	Mogul	3.90	4.00
400	PS40	Mogul	5.10	5.25
500	PS40	Mogul	5.60	5.75

Round Bulb Mazda B

		110 to 125 Volts		
25	G25	Medium	$0.55	$0.60
40	G25	Medium	.55	.60
60	G30	Medium	.75	.82
100	G35	Skirted	1.05	1.15
		220 to 250 Volts		
25	G25	Medium	$0.65	$0.70
50	G25	Medium	.65	.70

Tubular



Watts	Length Bulb	Base	Clear	Frosted
		110 to 125 Volts		
25	5⅞ in.	Medium	$0.60	$0.65
25	12 in.	Medium	1.20	1.30
40	12 in.	Medium	1.20	1.30

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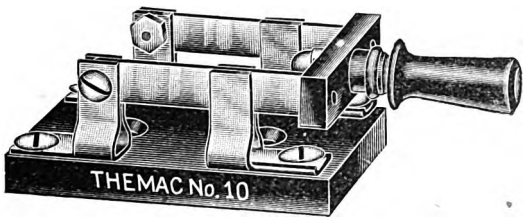
SWITCHES, VOLT AND AMMETERS

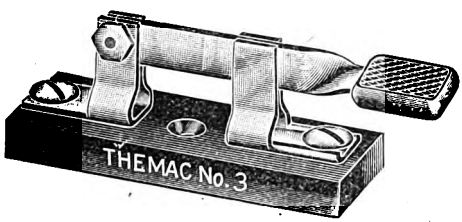
DOUBLE POLE SWITCHES



Cut Shows Single Throw

No.		Each
1	Single throw, insulated handle	$0.75
2	Double throw, insulated handle	1.25

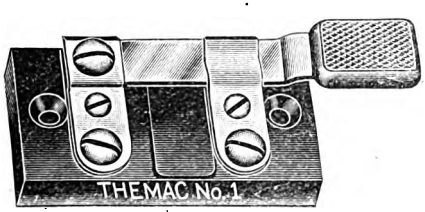
SINGLE POLE SWITCHES



Cut Shows Single Throw

No.		Each
1	Single throw, insulated handle	$0.25
2	Single throw, plain handle	.27
3	Double throw, plain handle	.35
4	Double throw, insulated handle	.37

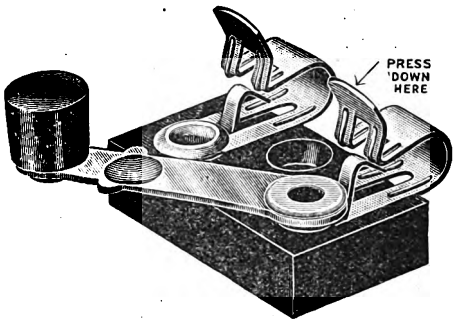
SINGLE POLE SIDE THROW SWITCHES



Cut Shows Single Throw

No.		Each
1	Single throw, plain handle	$0.20
2	Single throw, insulated handle	.22
3	Double throw, plain handle	.35
4	Double throw, insulated handle	.37

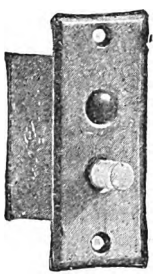
FAHNESTOCK CLIP SWITCH



	Each
Fahnestock, single throw	$0.20
Fahnestock, double throw	.30

PUSH BUTTON SWITCHES

Brass or Nickel Finish



1 gang, 1x2 in.	$0.80
2 gang, 1x2 in.	1.60
3 gang, 1x2 in.	2.40
4 gang, 1x2 in.	3.20
5 gang, 1x2 in.	4.00

POCKET METERS

Ammeter ..... each,	$1.00
Volt and ammeter ..... each,	2.00

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CLIPS, TERMINALS AND IGNITION CABLE

TERMINAL AND BATTERY CONNECTOR ASSORTMENTS

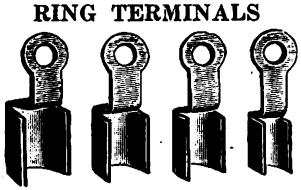
Cut Shows No. 1 Assortment

This assortment contains all styles that are most commonly used.

Put up in good, strong counter display boxes.

No. 1 Assortment $10.00
No. 2 Assortment 5.00

RING TERMINALS



Wing type; attached by forming wings around the cable, with drop of solder in ferrule. Copper stamping. Diameter of eye, 3/32 in. Made in four sizes.

		Per Doz.
No. 1	For small primary cable.....	$0.25
No. 2	For medium primary cable....	.35
No. 3	For average secondary cable..	.40
No. 4	For large secondary cable....	.50

PERFECTION BATTERY CONNECTORS

Can be used with or without nut, has four points of contact.

Per 100 .....$5.00

STANDARD BATTERY CONNECTORS

Per 100 .....$3.00

QUICK ACTION BATTERY CONNECTORS

Better than pieces of wire. They more than save their cost in added security—decreased resistance between cells.

Per dozen $0.35

IGNITION CABLE

Double Braided Secondary

Braided high tension cable for magneto and coil wiring.

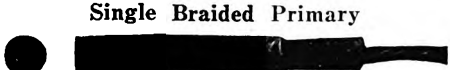
Type 20.....per 100 ft., $12.00

Single Braided Secondary

Single braided secondary for magneto and coil wiring.

Type 22.....per 100 ft., $9.00

Single Braided Primary



Used for ignition and lighting work.

Type 16.....per 100 ft., $7.00

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BATTERIES

Screw Connection

COLUMBIA IGNITOR

The Battery Built for Hard Work

Ignitors are what the wise engine owner demands. He knows they outlast every other make.

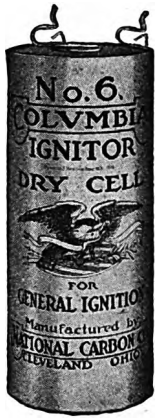
For ignition work they give a hot, steady spark. They aren't likely to give out suddenly, three miles from shore.

The name of the largest battery makers in the world on every cell is all the guarantee you need.

Less than 12.....each, $....
12 to 50.....each, ...
50 to 125.....each, ...

We ship Ignitors promptly from fresh stock

Fahnestock Connection



COLUMBIA MULTIPLE BATTERIES

A patented unit battery for heavy service. This battery is enclosed in an hermetically sealed metal case. It is waterproof.

All inside connections are soldered so that short circuits and broken connections are impossible. Only two connections to make to place the battery in service.

It is made in any voltage for all ignition systems. Properly chosen it will furnish current for a season's ignition, for horn or for low drain lighting service. For motor boats it is the only safe source of current.

It will cut down your battery bill. One Columbia Multiple Battery will last longer than the same number of dry cells used one set at a time.

Type	346	266	256	356	536
Voltage	6	9	7½	7½	4½
Each	$....	....	....	....	....

COLUMBIA HOT SHOT IGNITION BATTERY

Columbia Hot Shot Batteries are made in all sizes for any sort of ignition and lighting service. It is a unit battery, moisture proof and highly efficient and economical. It is designed to do away with the loose connection troubles of a single set of batteries connected with loose wires.

Type	Voltage	Length	Width	Height	Each
146	6.0	10⅝	2¾	7¼	$....
246	6.0	10⅝	5⅜	7¼	....
156	7.5	8	4⅞	7¼	....
256	7.5	13¼	5⅜	7¼	....
166	9.0	8	5⅜	7¼	....
266	9.0	15¾	5⅜	7¼	....

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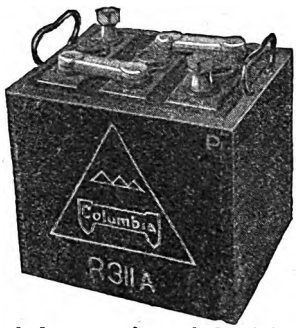
COLUMBIA STORAGE BATTERIES

Dozens of improvements are included in the Columbia Storage Battery that should readily place it in the storage battery field where Columbia stands today in the dry battery trade.

POSITIVE PLATE: These plates are designed to develop exceptional capacity for maximum life. The grid construction is an improved Bradbury or lattice type giving increased conductivity, strength and durability.

NEGATIVE PLATE: These plates are designed especially to balance the exceptional capacity of the positive plates and insure maximum life of element. The grid construction is the improved Bradbury or lattice type as used with the positive plates.



RIVETED POST SEAL: Plate Strap Posts are firmly riveted into the reinforced molded cover. A rigid and perfect alignment between elements and cover is secured. This construction prevents acid creepage up the posts and eliminates all vibration or movement of element in the cell, thus materially increasing the natural battery life.

VENT PLUG: This Plug is a large threaded type with vents around the vertical surface. It is designed to prevent spraying of acid during charge and impurities from entering the cell.

All batteries listed in table below are intended solely for ignition and lighting service. Such types will not serve for starting purposes and the Columbia guarantee is violated should these types be applied to automobile or other gas engine starting service.

COLUMBIA 6 VOLT LD TYPE LIGHTING BATTERY

Battery Type	Overall Outside Dimensions Including Handles Long Inches	Wide Inches	High Inches	Wght. Lbs. Net	Amp. Hr. Capacity When Discharged At Rate of 1-Amp.	5-Amp.	10-Amp.	Charging Rate Normal Charge Amps.	Maximum Continuous Charge	Terminals	Each
LD 35A	7⅜	7¼	8⅞	21	30	25	22	2	3	Standard	$....
LD 37V	8¼	7¼	7	25	50	37.5	30	3	4.5	Standard	....
LD 39A	7½	7¼	8⅞	34	70	54	45	4	6	Standard	....
LD311A	8⅞	7¼	8⅞	41	90	70	60	5	7.5	Standard	....
LD313A	10 3/16	7¼	8⅞	48	110	85	75	6	9	Standard	....
LD315A	11½	7¼	8⅞	53	130	102.5	90	7	10.5	Standard	....
LD319A	14 1/16	7¼	8⅞	69	170	135	125	9	13.5	Standard	....

CASE: The material used in all Columbia Battery Cases is carefully selected, seasoned hardwood. Each case is thoroughly treated with a high grade acid resisting paint, case corners are mortise-tenon, glued and dowel-pinned.

HANDLE: Round steel handles heavily plated with copper and lead and then coated with acid resisting paint are securely anchored into the hardwood case. There are no fastenings to be exposed to corrosion. These handles will sustain 25 times the weight required without injury.

JAR: Columbia Moulded Jars made of highest quality hard rubber. They are thoroughly tested for strength or defect.

MOULDED JAR COVER: The material used is the highest quality hard rubber properly reinforced so that breakage is reduced to a minimum. Polarity of each cell is molded in raised letters on both ends of the cover which insures proper assembly of cells and installation of battery. This type of cover requiring less jar sealing compounds permits maximum cooling effect.

ACID SPACE: The space provided by the cover construction is exceptionally large so that a reserve quantity of electrolyte may at all times be maintained in each cell. This reduces to a minimum the liability of damage to the cell due to infrequent addition of distilled water.

JAR RIB: Each Jar contains four Ribs on which the plates and separators rest. This evenly distributes the weight of the element which reduces the liability of jar breakage and plate trouble. The height of the ribs is such as to provide ample space for sediment to collect without interfering with the action of the cell.

SEPARATOR: Columbia Separators are made from carefully selected wood. The material selected insures maximum Porosity, Life, and Battery Capacity under all conditions of service. These results can not be equaled if any other separator material is used.

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IGNITION SYSTEMS AND SPARK COILS

PERFEX MASTER VIBRATOR

Used with One or More Model I Ignitors
Model V

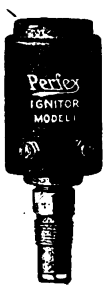
For use with Perfex Ignitors on marine engines. All parts are interchangeable. Adjustment is made by turning metal cap at top of vibrator.

Model V .....each, $4.00

PERFEX IGNITOR

Induction Coil and Spark Plug Used with Model V Vibrator

Model I



The Model I Ignitor is designed for use with a separate vibrator model. Advantages are claimed where two or more cylinders are used, as the adjustment of the master vibrator gives the same quality and quantity of spark at the spark gap of each ignitor and results in a smooth even-running engine.

Model I.....each, $5.00

PERFEX ALL-IN-ONE

Combined Spark Plug, Induction Coil and Vibrator

Model B

Detachable Spark Plug

Porcelain Renewable

A complete, self-contained, high-tension, jump spark ignition system, including induction coil, condenser and removable vibrator, all in a single small casing mounted directly on the spark plug which can be detached and the porcelain renewed.

The remarkable small size of the device —2 in. diameter and 3 in. high above the spark plug—is possible only because of our new coil winding method by which the secondary winding is reduced in size nearly 40 per cent without reducing the number of turns and with an actual increase in efficiency.

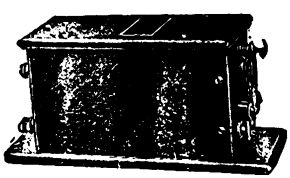
Adjustment is made by turning metal cap at the top of ignitor. The cap is held in place by a ratchet which maintains the adjustment.

Model B complete.....$6.00

K. W. SPARK COILS

Dash Coil

Model M Marine Coil



Model 01 Coil

Dash Coil with Switch

No. cylinders	2	3	4	5	6
Mahogany .....each,	$12.00	18.00	24.00	30.00	42.00

Model M Marine Coils, mahogany finish .....each, 6.00
Model O1 one cylinder, oak box.....each, 7.00

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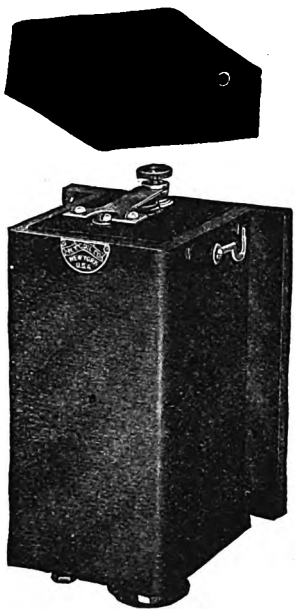
SPARK COILS

SPARK COILS



Marine coil with waterproof cover.

Nos.	70	71	72	73	74
Cylinders	1	2	3	4	6
Each ...	$10.00	17.50	25.00	32.50	47.50

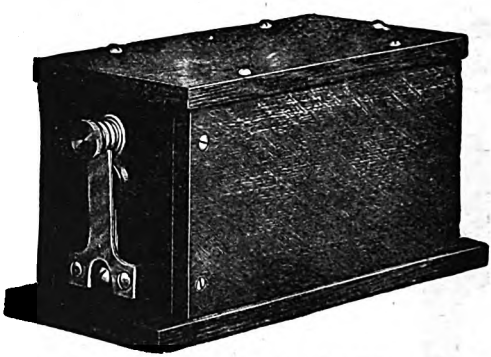
SENIOR MASTER VIBRATOR

Complete with regular snap.

Switch	$12.00
With kick switch	14.00

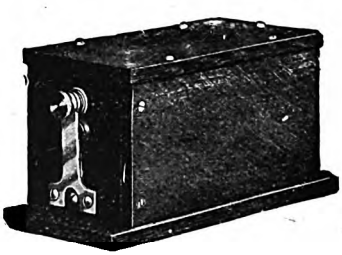
BOX COILS

Nos.	60	61	62	63	64
Cylinders	1	2	3	4	6
Each	$6.25	12.50	18.75	25.00	37.50



For heavy duty engines of 5 H.P. or more.

Nos.	10	11	12	13	14
Cylinders	1	2	3	4	6
Each	$7.50	15.00	22.50	30.00	45.00



Midget

Nos.	55	56	57	58	59
Cylinders	1	2	3	4	6
Each	$5.00	10.00	15.00	20.00	30.00

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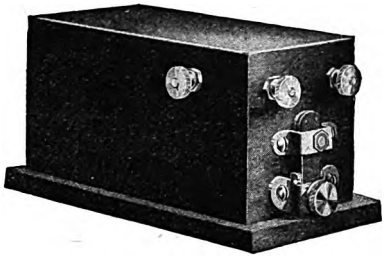
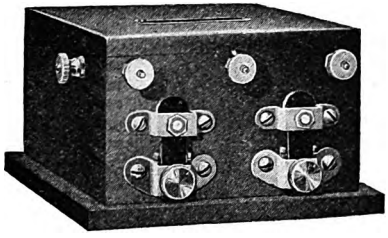
SPARK COILS AND TIMERS

DETROIT JUMP SPARK COILS



Type K1



Type K2

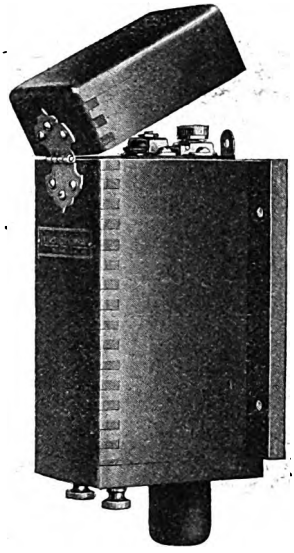
Type K1	One cylinder	$ 8.00
Type K2	Two cylinder	16.00
Type K3	Three cylinder	24.00
Type K4	Four cylinder	32.00

Type KC

Type KC has a polished and lacquered brass cap over the vibrator, otherwise identical with Type K.

Type KC1	One cylinder	$ 9.00
Type KC2	Two cylinder	18.00
Type KC3	Three cylinder	27.00
Type KC4	Four cylinder	36.00

DETROIT JUMP SPARK COILS



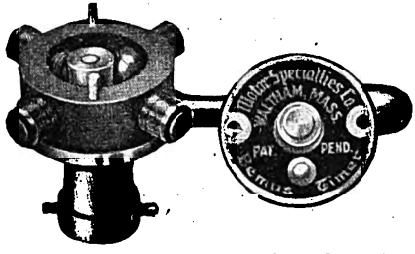
Type D

Marine Dash Coils

This coil is put up in a very handsome wooden case. The cover is fastened with a polished and lacquered brass hinge and a spring catch. All terminals are brought out at the bottom. The vibrator, windings, and internal construction are identical with Type K.

Type D1	One cylinder	$10.00
Type D2	Two cylinder	20.00
Type D3	Three cylinder	30.00
Type D4	Four cylinder	40.00

BEMUS TIMERS



Cylinders	1	2	3	4	6
No. 1700....each,	$4.75	5.25	5.50	6.00	6.50
No. 1300....each,	5.00	5.50	6.00	6.50	7.00

No. 1300 has circuit breaker.

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FLASHLIGHTS AND MAZDA LAMPS

FLASHLIGHTS

Tubular Fibre Case

Complete with Bulb and Battery

		Each
No. 2602	Daylos vulcanized fibre, 1¼x5½ in..	$1.55
No. 791	Renewal battery	.30
No. 1182	Renewal Mazda bulb, 2.7 volts.....	.20
No. 2604	Daylos vulcanized fibre, 1½x6½ in..	1.90
No. 790	Renewal battery	.35
No. 1198	Renewal Mazda bulb, 2.9 volts.....	.20
No. 2612	Daylos vulcanized fibre, 1½x8½ in...	2.20
No. 705	Renewal battery	.50
No. 1193	Renewal Mazda bulb, 3.8 volts.....	.20

Miners' Fibre Case

Complete with Bulb and Battery

		Each
No. 2616	Daylos vulcanized fibre, 1½x6½ in..	$2.20
No. 790	Renewal battery	.35
No. 1198	Renewal Mazda bulb, 2.9 volts.....	.20
No. 2619	Daylos vulcanized fibre, 1½x8½ in..	2.45
No. 705	Renewal battery	.50
No. 1193	Renewal Mazda bulb, 3.8 volts.....	.20

Vest Pocket Nickel Case

Complete with Bulb and Battery

		Each
No. 6961	Daylos nickel plated, ¾x1¾x3 in....	$1.20
No. 750	Renewal battery	.30
No. 1180	Renewal Mazda bulb, 2.5 volts.....	.20
No. 6962	Daylos nickel plated, ¾x2¼x3 in....	1.45
No. 751	Renewal battery	.40
No. 1181	Renewal Mazda bulb, 3.8 volts.....	.20

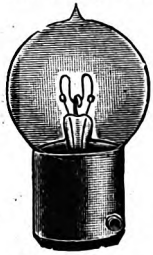
MAZDA LAMPS

For Low Voltage Service

Tail Lamp Size

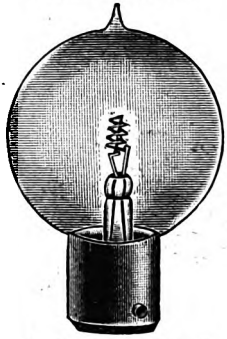
Style G6 6-8 volts, 2 c.p.....each, $0.28

Side Lamp Size



Style G8 6-8 volts, 5 c.p.....each, $0.30

Head Lamp Size



Mazda B Focusing Type

Style G12 6-8 volts, 15 c.p....each, $0.50

Mazda C Nitrogen

Style G12 6-8 volts, 21 c.p....each, $0.52

We supply lamps in either Miniature, Candelabra or Ediswan base. When ordering, always specify style of base wanted.

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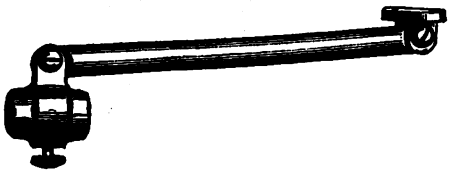
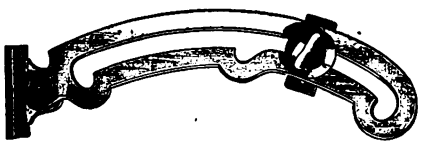
MARINE HARDWARE

SKYLIGHT RAISERS
Polished Brass



No. 1 Length 11 in.....per pair, $3.50

SKYLIGHT QUADRANTS
Brass



Length, in.	5	8	9	10	12
Finished, per pair,	$1.00	1.50	1.75	2.00	2.50
Polished, per pair,	1.25	2.00	2.25	2.50	3.00

SKYLIGHT HINGES
Brass

Size Between Joints, In.	Length of Strap, In.	Plain Per Pair	Polished Per Pair
2	4½	$1.25	$2.00
2½	4½	1.25	2.00
3	4½	1.25	2.00
3½	4½	1.25	2.00
4	4½	1.25	2.00
4½	4½	1.35	2.25
5	5½	1.35	2.25
5½	5½	1.50	2.50
6	5½	1.50	2.50

CUDDY DOOR HINGES
Heavy Cast Brass

Length, in.	3	3½	4	5
Plain, ...per pair,	$0.25	.30	.40	.50
Polished, ..per pair,	.35	.45	.50	.75
Length, in.		6	7	8
Plain .....per pair,		$0.75	1.10	1.60
Polished .....per pair,		1.00	1.60	2.00

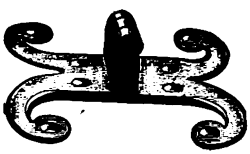
Measure the whole length when open.

STRAP HINGES
Galvanized Malleable Iron and Cast Brass

Entire Length Inches	Galvanized Per Pair	Plain Brass Per Pair	Polished Brass Per Pair
4	$0.20	$0.40	$0.60
5	.25	.45	.65
6	.30	.50	.75
7	.35	.60	.85
8	.40	.65	.95
9	.50	.90	1.30
10	.60	1.00	1.40
12	.90	1.40	1.80
14	...	1.80	3.00
16	...	2.30	4.00

Measure the whole length when open.

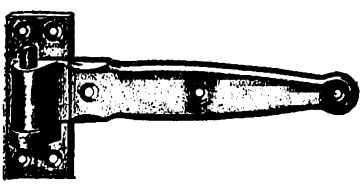
RAISED SCROLL HINGES
Brass



Size, in.	5x1	5x1¼	5x1½
Plain .....per pair,	$1.25	1.45	1.60
Polished ...per pair,	1.85	2.10	2.30

Measure the whole length when open.

HOOK OR CABIN DOOR HINGES
Galvanized Malleable Iron and Brass



Length, in.	4	6	8	11	13
Galv. .....pair,	$0.40	.50	.75	.90	1.15
Plain brass..pair,	.65	.75	1.15	1.20	1.60
Pol. brass....pair,	.90	1.05	1.50	1.70	2.00

Measure from center pin.

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MARINE HARDWARE

PLAIN LOOSE PIN BUTTS

Heavy Cast Bronze with Composition Pins and Washers

Size, In.	Screw Holes	Size Screws	Per Doz. Pairs
2 x2	6	6	$....
2½x2½	6	6	....
3 x2½	8	8	....
3 x3	8	8	....
3½x2½	8	8	....
3½x3½	8	10	....
4 x4	10	10	....
4½x4½	10	10	....
5 x5	10	10	....

BALL OR ACORN TIP, LOOSE PIN BUTTS

Cast Bronze with Composition Pins and Washers, Acorn Tip

Size, In.	Screw Holes	Size Screws	Per Doz. Pairs
2 x2	6	6	$....
2½x2½	6	6	....
3 x2½	8	8	....
3 x3	8	8	....
3½x2½	8	8	....
3½x3½	8	10	....
4 x4	10	10	....
4½x4½	10	10	....
5 x5	10	10	....

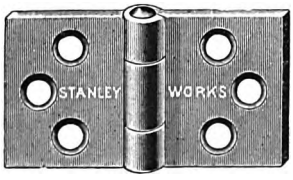
WROUGHT STEEL, REVERSIBLE

Size, In.	Screw Holes	Size Screws	Per Dozen Pairs Bright	Galv.
2 x2	4	7	$1.40	3.25
2½x2½	6	8	1.80	4.05
3 x2½	6	9	2.40	4.60
3 x3	6	9	2.60	4.80
3½x3	6	10	3.60	6.30
3½x3½	6	10	3.80	6.90
4 x4	8	10	4.70	9.40
4½x4½	8	11	5.90	11.90
5 x5	8	12	7.70	14.35

CAST BRONZE WITH BALL TIP

Size, In.	Screw Holes	Size Screws	Per Doz. Pairs
2 x2	6	6	$....
2½x2½	6	6	....
3 x2½	8	8	....
3 x3	8	8	....
3½x2½	8	8	....
3½x3½	8	10	....
4 x4	10	10	....
4½x4½	10	10	....
5 x5	10	10	....

BACK FLAP HINGES



Length, in. open	1	1¼	1½	1¾	2	2
Width, in.	2	2 5/16	2¾	3 3/16	3 11/16	4⅜
Brass ....per doz. pairs, $	...	...	...	...	...	...
Bt. steel, per doz. pairs,	.75	.90	1.05	1.30	1.40	1.70
Galv. ....per doz. pairs,	1.60	2.00	2.50	3.00	3.50	3.75

Bronze and brass hinges are put up with screws. Galvanized hinges have brass pins and galvanized screws.

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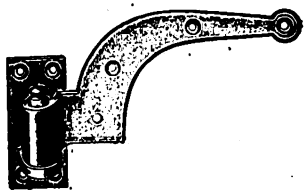
MARINE HARDWARE

RAISED CURVED HOOK HINGES

Brass

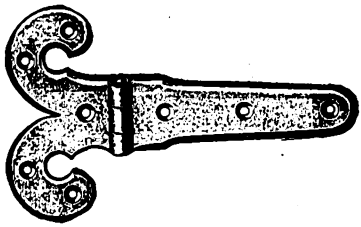


Length, in.	6	8	10
Plain .....per pair,	$1.80	2.90	3.35
Polished .....per pair,	2.05	3.25	3.75

Measure from center of pin

PORT HINGES

Galvanized Malleable Iron and Cast Brass

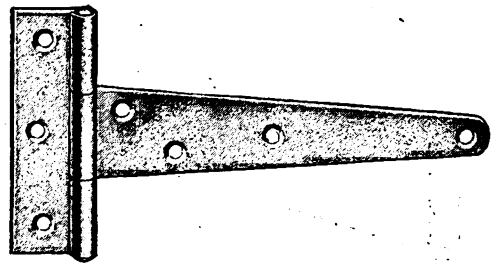


Entire Length Inches	Galvanized Pair	Plain Brass Pair	Polished Brass Pair
4	$0.30	$0.45	$0.70
5	.35	.50	.75
6	.40	.60	.95
7	.45	.70	1.00
8	.50	.75	1.05
9	.60	.90	1.20
10	.75	1.10	1.50
12	1.00	1.50	1.90
15	1.50	2.50	3.00
18	...	4.00	5.00

Measure the whole length when open.

T HINGES

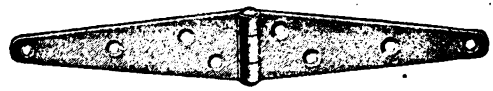
Galvanized Wrought Iron Brass Pins



Length of Strap, In.	Width of Strap, In.	Length Joint Inches	Per Doz. Pairs
3	1 1/16	2½	$1.50
4	1 1/16	2¾	1.70
5	1 3/16	3	2.10
6	1¼	3½	2.50
7	1½	3½	2.90
8	1 9/16	4	3.25
9	1⅝	4½	4.10
10	1¾	4½	4.60
12	2⅛	4¾	6.70
14	2¼	5½	10.50

STRAP HINGES

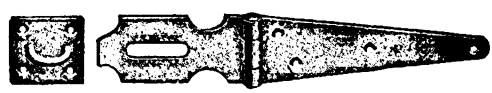
Galvanized Wrought Iron, Brass Pins



Length of Strap, In.	Light Width Joint Inches	Light Per Doz. Pairs	Heavy Width Joint Inches	Heavy Per Doz. Pairs
3	1⅛	$1.45	...	....
4	1⅛	2.00	1 9/16	$3.30
5	1 5/16	2.80	1 13/16	5.00
6	1 9/16	3.75	2½	7.80
7	1⅞	4.50	...	...
8	1⅞	5.00	3	12.35
10	2 1/16	6.90	3 7/16	19.00
12	2¾	10.80	4	27.50
14	2 13/16	15.00	4½	30.40
16	.....	....	4⅝	34.30

HINGE HASPS

Galvanized Iron Brass Pins



Length Strap, in..	3	4½	6	8	10
Width at joint, in.	1⅛	1⅛	1½	1⅞	2 3/16
Per dozen	$0.85	1.15	1.55	2.10	3.20

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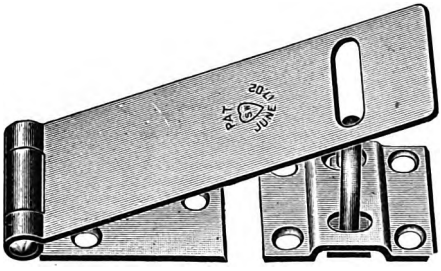
MARINE HARDWARE

SAFETY HASPS

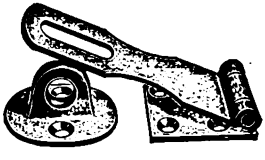
Galvanized Iron, Brass Pins



Length strap, in.	4½	6	7
Width joint, in.	1½	1⅞	2½
Per dozen	$2.25	3.50	6.50

SECURITY HINGE HASP

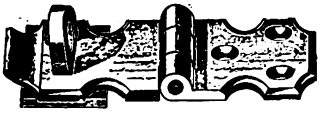
Cast Brass



Length, in.	3	3¾
Width, in.	1	1⅛
Polished per doz.,	$3.60	6.00

BOSTON HINGE HASP

Malleable Iron and Brass



Length Inches	Galvanized Each	Plain Each	Polished Each
3	$0.16	$0.28	$0.50
4	.20	.32	.66
5	.25	.50	.88
6	.30	.70	1.20
8	.50	1.00	1.60
10	..	1.66	2.50

Measure whole length when open.

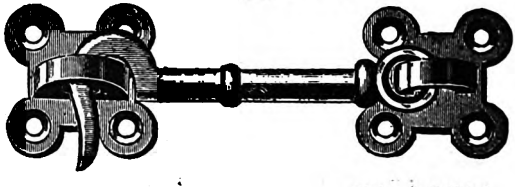
REGULAR HINGE HASP

Malleable Iron and Brass

Entire Length Inches	Length Strap Inches	Galvanized Per Doz.	Plain Brass Per Doz.	Polished Brass Per Doz.
6	3¾	$2.40	6.50	9.75
8	4¾	3.25	8.00	11.00
10	6	4.25	10.00	14.50
12	8½	5.75	13.00	17.50

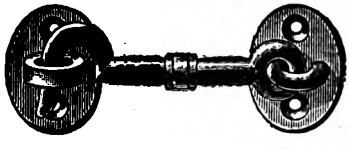
CABIN DOOR HOOKS

Extra Heavy Pattern



Length of Hook Inches	Dimensions of Plate Inches	Plain Brass Dozen	Polished Brass Dozen
2½	1½x1½	$5.00	7.00
3⅛	1½x1½	5.50	7.50
3⅞	1½x1½	6.00	8.00
5½	1⅞x1⅞	7.00	9.00
6½	1⅞x1⅞	8.00	10.00
7½	1⅞x1⅞	8.50	11.00

Light Pattern



Length of Hook Inches	Dimensions of Plate Inches	Emery Finish Dozen	Polished Brass Dozen
1½	1¼x ⅞	$1.75	2.50
2	1⅜x1	1.75	2.50
2 7/16	1⅜x1	2.00	3.00
2¾	1⅜x1	2.25	3.25
3¼	1½x1 1/16	2.75	4.00
3⅞	1½x1 1/16	3.00	4.50

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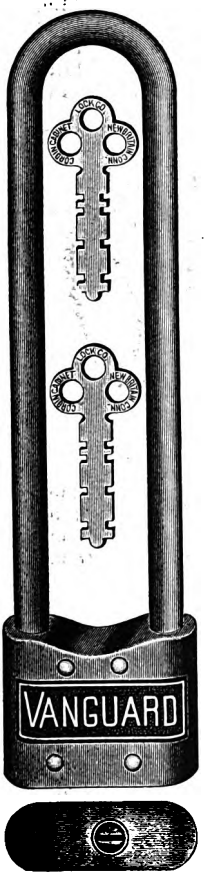
PADLOCKS

Heavy cast spring shackle, 2 nickel plated flat steel keys, 5 changes.

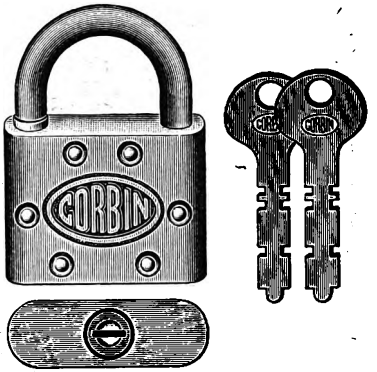
No. 2806¼ 2 in. steel, black japanned, brass plated shackle.....per doz., $1.90



Motorcycle

Heavy spring shackle 6¼ in. long, 4 wards, 2 nickel plated flat steel keys, 6 changes.

No. 2872H 2 inch cast iron case, rustless finish, nickel plated shackle .....per doz., $8.50



Heavy wrought steel spring swivel shackle, 2 nickel plated flat steel keys, 6 changes.

No. 02829 2⅛ in. cast brass polished, nickel plated shackle.....per doz., $5.00

Heavy spring shackle, six secure levers, two nickel plated flat steel keys to each lock.

No. 0965A 2¼ in. cast brass, polished, all different in a dozen.....$7.90

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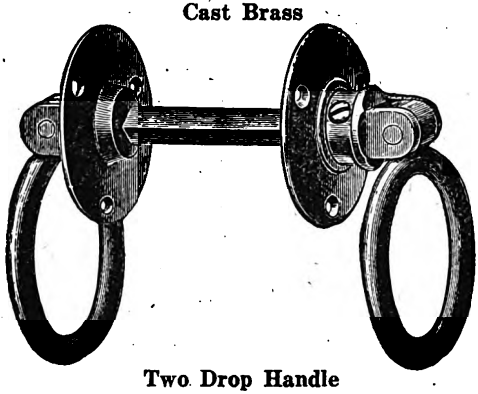
STANDARD SHIP KNOBS

MORTISE
Cast Brass

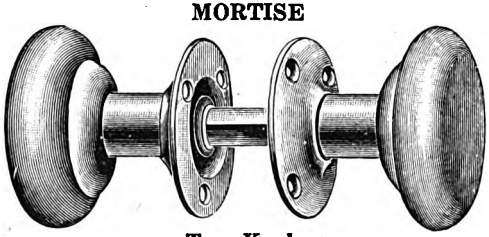


Two Drop Handle

Size No.	Size Spindle Inches	Oval Handles Inches	Round Handles Inches	Polished Per Doz.
27	5/16	1¼x¾	1	$12.00
28	5/16	1¼x¾	1½	14.00
29	⅜	1 13/16x13/16	1⅝	16.00
30	⅜	1 13/16x13/16	1⅝	18.00

Dimensions of handles are inside diameter.

MORTISE



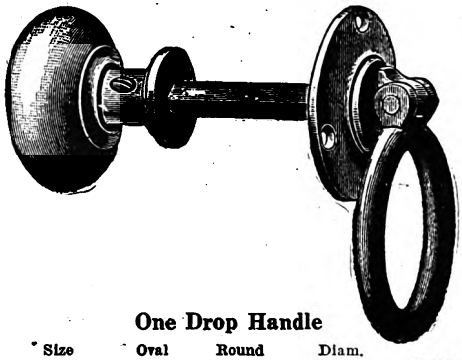
Two Knobs

Size No.	Size Spindle Inches	Diam. Knob Inches	Diam. Shank Inches	Size Screws No.	Polished Per Doz.
3	5/16	1½	21/32	4	$11.00
4	5/16	1¾	21/32	4	11.00
5	5/16	2	21/32	4	12.00
6	⅜	2	21/32	4	13.00
7	5/16	2¼	21/32	4	14.00
8	⅜	2¼	21/32	4	16.00

One Drop Handle

Size No.	Size Spindle Inches	Oval Handle Inches	Round Handle Inches	Diam. Knob Inches	Polished Per Doz.
15	5/16	1¼x¾	1	1½	$12.00
16	5/16	1¼x¾	1	1¾	12.00
17	5/16	1 13/16x13/16	1½	2	14.00
18	⅜	1 13/16x13/16	1½	2	15.00
19	5/16	.....	1⅝	2¼	16.00
20	⅜	.....	1⅝	2¼	18.00

RIM

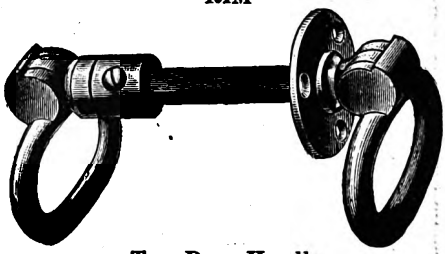


One Drop Handle

Size No.	Size Spindle Inches	Oval Handle Inches	Round Handle Inches	Diam. Knob Inches	Polished Per Doz.
21	5/16	1¼x¾	1	1½	$12.00
22	5/16	1¼x¾	1	1¾	12.00
23	5/16	1 13/16x13/16	1½	2	14.00
24	⅜	1 13/16x13/16	1½	2	15.00
25	5/16	.....	1⅝	2¼	16.00
26	⅜	.....	1⅝	2¼	18.00

Dimensions of handles are inside diameter.

RIM



Two Drop Handle

Size No.	Size Spindle Inches	Oval Handles Inches	Round Handles Inches	Polished Per Doz.
31	5/16	1¼x¾	1	$12.00
32	5/16	1¼x¾	1½	14.00
33	⅜	1 13/16x13/16	1⅝	16.00
34	⅜	1 13/16x13/16	1⅝	18.00

Two Knobs

Size No.	Size Spindle Inches	Diam. Knob Inches	Diam. Shank Inches	Size Screws Inches	Polished Per Doz.
9	5/16	1½	21/32	4	$11.00
10	5/16	1¾	21/32	4	11.00
11	5/16	2	21/32	4	12.00
12	⅜	2	21/32	4	13.00
13	5/16	2¼	21/32	4	14.00
14	⅜	2¼	21/32	4	16.00

We furnish oval shape knobs to order same as above for 10 per cent. net additional. Specify whether wanted in brass or bronze and with oval or round handles.

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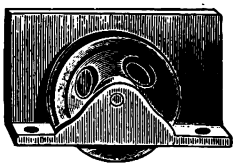
MARINE HARDWARE

SLIDING DOOR SHEAVES

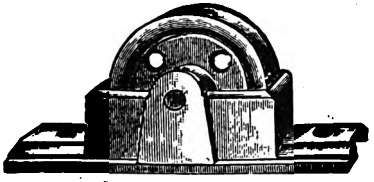
Brass



Diam. sheave 1¼x¼ in.....each, $0.50

SLIDING DOOR SHEAVES

Brass

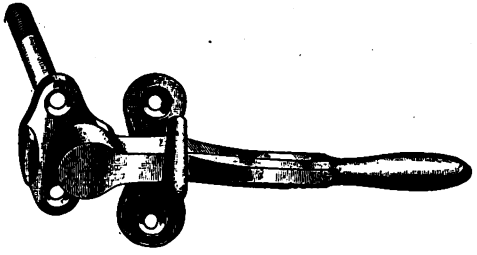


Diam. sheave 1½x⅜ in.....each, $0.30
Diam. sheave 1¾x$\frac{7}{16}$ in.....each, .35
Sheave track, brass plated, per ft.... .06
Solid brass, per ft..... .12

In 4, 6 and 8-foot lengths

ICE BOX LEVERS

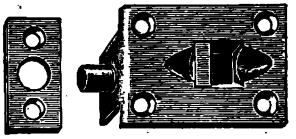
Polished Brass



No.	Length of Handle, In.	Polished Brass Per Doz.
1	12	$33.00
2	9	18.00
3	6½	10.00
4	5½	7.00
5	4½	5.50

FLAT BOLTS

Polished Brass



Length, in.	2	2½	3	3½
Per doz.	$2.55	2.90	3.80	4.65

FLUSH BOLTS

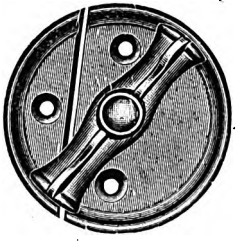
All Brass, Polished

All ⅝ inch wide

Length, in.	2½	3	4	5	6
Per doz.	$2.30	2.45	3.20	3.90	4.55

CUPBOARD TURNS

Cast Bronze, Polished



Size, length, in.	1	1¼	1¾
Without strike, width, in.	1½	1½	1½
Per doz.	$4.00	4.25	4.75

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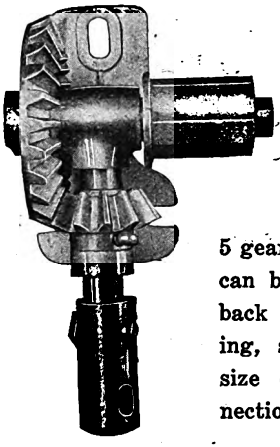
AWNING HARDWARE

TOP GEAR AND END BRACKET COMBINED

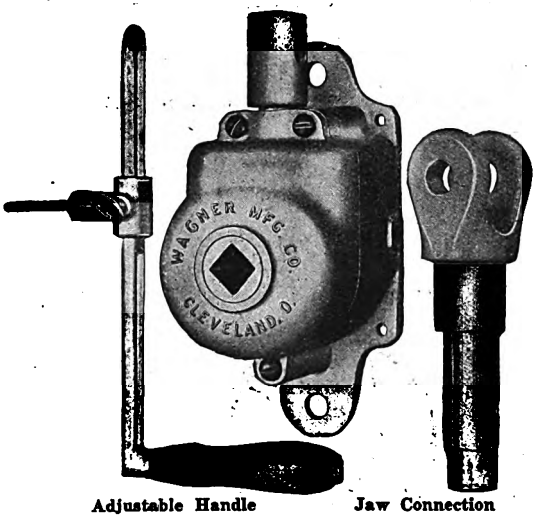


For Pipe Roller

Has 2½ inch projection for 1¼ and 1½ steel or pipe rollers only; can be used with No. 3 or No. 5 gear box. Back plate can be bolted to 6 in. back board. In ordering, specify kind and size drive shaft connection required.

No. 5 Aluminum finish .....$....
No. 5 Galvanized finish ....

No. 3 AUTOMATIC GEAR BOX



Adjustable Handle Jaw Connection

Automatic, self locking with adjustable handle, 3½ in. wide on face, 7¾ in. long over all. Projects 3½ in.

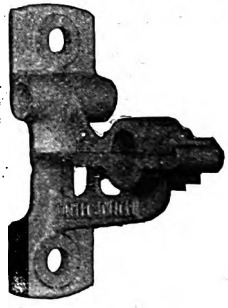
No. 3 Aluminum finish .....$....
No. 3 Galvanized finish ....

No. 5 AUTOMATIC GEAR BOX

Automatic self locking, for use with No. 5 top gear on prism glass fronts. Back plate is 7 in. long, 3⅜ in. wide and projects 3 in. Has socket connection for use with plain drive shaft of ⅝ in. iron or ⅜ in. pipe.

No. 5 Aluminum finish .....$....
No. 5 Galvanized finish ....

ROLLER AWNING END BRACKETS



No. 1 End Bracket

For use on all roller fixtures except No. 5. Has 3½ in. projection, back plate is 5¾ in. long over all by 2 in. wide. Can be attached to top board or plank as well as to face of building. Provision is made for easy insertion of roller by means of hinged cap held in place by one bolt.

No. 1 Aluminum finish .....$....
No. 1 Galvanized finish ....

No. 5 End Bracket

Has 2½ in. projection, for use with No. 5 roller fixture.

No. 5 Aluminum finish .....$....
No. 5 Galvanized finish ....

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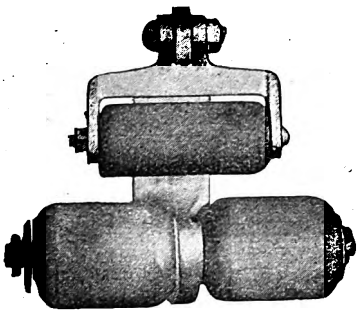
AWNING HARDWARE

ROLLER AWNING CENTER SUPPORTS

For Pipe Rollers

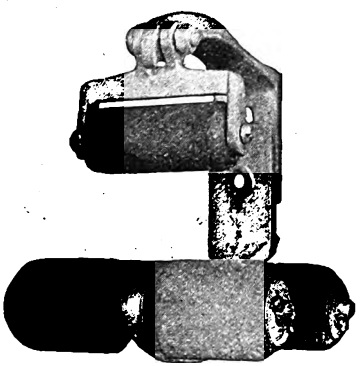


For use with pipe rollers from 1½ to 2 inch, made of malleable iron, rollers are hard wood soaked in oil, upper casting is held in place by bolt and nut, and is easily removed. Projection 3½ inches.

No. 2 Aluminum finish .....$....
No. 2 Galvanized finish ....

ROLLER AWNING CENTER SUPPORTS

For Wood Rollers

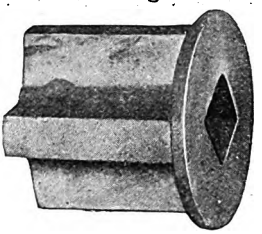


This support is constructed same as No. 2 except that it is made in two parts, allowing for adjustment to various size wood rollers. The upper casting is self locking and prevents roller from jumping out of center support.

No. 3 Aluminum finish .....$....
No. 3 Galvanized finish ....

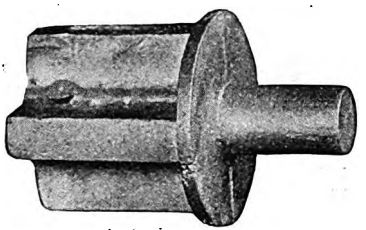
ROLLER AWNING PLUGS AND GUDGEONS

Drive Plugs for No. 1 Outfits Only



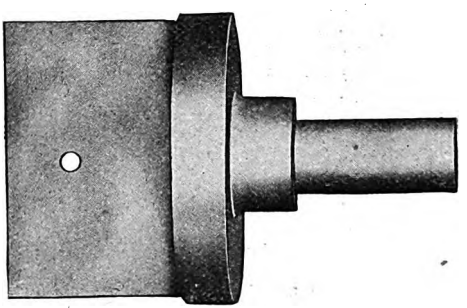
No.	Size Inches	Each
5	1¼	$....
6	1½	....
7	2	....

Gudgeons for All Pipe Outfits



No. 1 1¼ inch .....each, $....
No. 2 1½ inch .....each, ...
No. 3 2 inch .....each, ...

WOOD ROLLER GUDGEONS



No. 8 3 inch .....each, $....
No. 9 3½ inch .....each, ...

When ordering drive plugs or gudgeons, mention the inside measurement of the hole in the pipe or tube where they are to be used.

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AWNING HARDWARE

COUPLINGS FOR PIPE ROLLERS

Made of malleable iron for joining 1¼, 1½ and 2 inch pipe rollers.

Black .....each, $....

PIPE

Size, in.	½	¾	1	1¼	1½	2
Black, ..per ft., $	...	...	...	...	...	...
Galv. ...per ft.,	...	...	...	...	...	...

ROUND IRON

For head rods and frames

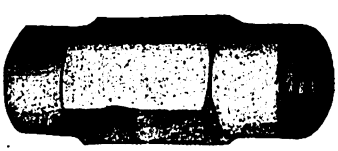
Size, in.	⅜	7/16	17/32	21/32
Black ....per lb., $	....	....	....	....
Galv. ....per lb.,	....	....	....	....

COUPLINGS

Malleable

Size, Inches	Black Per 100	Galv. Per 100
⅛ Pipe	$....	....
¼ Pipe or ½ bolt size	....	....
⅜ Pipe or ⅝ bolt size	....	....
½ Pipe	....	....
¾ Pipe	....	....
1 Pipe	....	....
1¼ Pipe	....	....
1½ Pipe	....	....
2 Pipe	....	....

ROD COUPLINGS

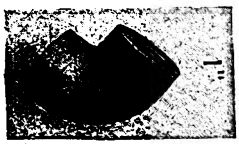


No. 1 For ⅜ in. iron; right hand thread only, used on trussed front rods.

Black .....per 100, $....

Galvanized .....per 100, ...

ELBOWS



Tapped for Bolts

Iron Pipe Size

Bolt Sizes

Size, in.	½	¾	¾x½	1x¾	1
Black, per 100, $	....	....	....	....	....
Galv., per 100,	....	....	....	....	....

Iron Pipe Sizes

Size, in.	¼	⅜	½	¾	1
Black, per 100, $	....	....	....	....	....
Galv., per 100,	....	....	....	....	....

I. P. Reducing Sizes

Size, in.	¼x⅜	⅜x½	½x¾	¾x1
Black ..per 100, $	....	....	....	....
Galv. ...per 100,	....	....	....	....

SLIP TEES

No.	Size, Inches	Black Per 100	Galv. Per 100
1	⅜ pipe or ⅝ bolt size	$....	....
2	½ pipe	....	....
4	¾ pipe	....	....
16	½x⅜ pipe	....	....
17	¾x½ pipe	....	....
18	1 x¾ pipe	....	....

PIPE FRONT ROD ENDS

Old Style

Nos.	1	2	3
Iron pipe size, in.	⅜	½	¾
Black .....per 100, $	....	....	....
Galvanized ....per 100,	....	....	....

New Style

Nos.	4	5	6	7
Iron pipe size, in.	⅜	½	¾	1
Black .....per 100, $	....	....	....	....
Galv. .....per 100,	....	....	....	....

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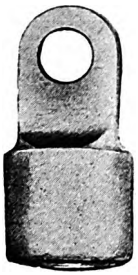
AWNING HARDWARE

EYE ENDS

With Small Hole

No.	Size, In.	Black Per 100	Galv. Per 100
1	⅜ bolt	$...	...
2	¼ pipe or ½ bolt	...	...
3	⅜ pipe or ⅝ bolt	...	...
4	½ pipe	...	...
5	¾ pipe	...	...
6	1 pipe	...	...

With Large Hole

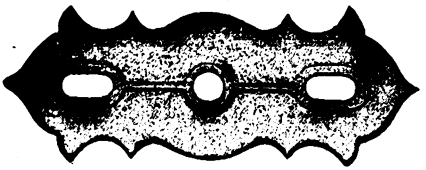


No.	Size, In.	Black Per 100	Galv. Per 100
7	⅜ bolt	$...	...
8	¼ pipe or ½ bolt	...	...
9	⅜ pipe or ⅝ bolt	...	...
10	½ pipe	...	...
11	¾ pipe	...	...

PLATES OR FLOOR FLANGES

Nos.	13	14	15	16
For pipe, in.....	½	¾	1	1¼
Black ...per 100, $....	....	....	....	....
Galv. ...per 100, ...	....	....	....	....

STUB OR FACE PLATES



For attaching to brick or stone, for ⅜ pipe or ⅝ iron rod.

Black .....per 100, $....
Galvanized .....per 100, ...

LONG STUB PLATES

Nos.	10	2	7	6	5
Iron pipe size, in....	½	⅜	⅜	⅜	⅜
Bolt size, in.	¾	⅝	⅝	⅝	⅝
Black .....per 100, $...	...	...	...	...	...
Galvanized .per 100,	...	...	...	...	...

STRAIGHT HINGE OR JAW STUB

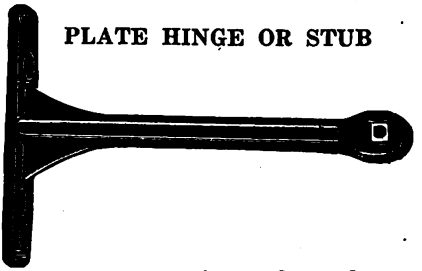
Plain, for Brick or Stone

Nos.	11	12	13	14	15
Length, in.	4	6	8	10	12
Black .....per 100, $...	...	...	...	...	...
Galvanized .per 100,	...	...	...	...	...

Threaded for Iron

Nos.	11	12	13	14	15
Length, in.	4	6	8	10	12
Black .....per 100, $...	...	...	...	...	...
Galvanized .per 100,	...	...	...	...	...

PLATE HINGE OR STUB



Nos.	1	2	3	4
Length, in.	2	3	4	5
Black ...per 100, $....		....	....	....
Galv. ...per 100,	....	....	....	....

Nos.	5	6	7
Length, in.	6	7	8
Black .....per 100, $....		....	....
Galvanized ....per 100,	....	....	....

JAW ENDS

No. 2 for ⅜ in. pipe or ⅝ in. rod.

Black .....per 100, $....
Galv. .....per 100, ...

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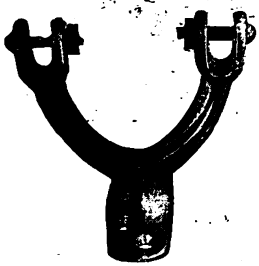
AWNING HARDWARE

DOUBLE STUBS

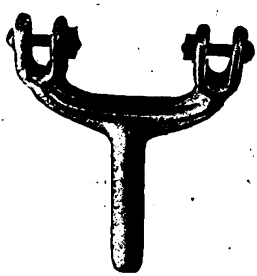
On Plate



With round head stove bolts, opening between jaws 3½ in., projection 4 in.

	Per 100
Black	$....
Galvanized	....

With Shank



Opening between jaws 3½ in., projects 6 in. for brick or stone, or with ⅝ in. plate for wood and with No. 8 plate for brick or stone.

	Per 100
Black	$....
Galvanized	....

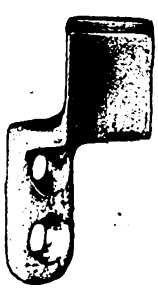
SIDE STUBS

With lag screw for brick walls 1½ in. Projection, lag screw ⅜x2½ in. Fits ⅜ lead sleeve or expansion shield.

No. 17 Galvanized .....per 100, $....

SLIDE ROD END SOCKETS

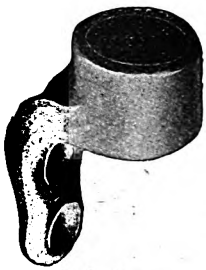
Plain



No.		For Rod Size, In.	Per 100 Blk.	Galv.
6	Square	½	$...	...
7	Square	⅝	...	...
8	Round	½	...	...
9	Round	⅝	...	...

SLIDE ROD ENDS

No. 1



Nos. 2, 3, 4

No. 5

No.	Size, Inches	Per 100 Black	Galv.
1	⅜ bolt	$....	....
2	¼ pipe or ½ rod	....	....
3	⅜ pipe or ⅝ rod	....	....
4	½ pipe	....	....
5	⅜ pipe or ⅝ rod	....	....

JAW SLIDES

No.		Size, Inches	Per 100 Black	Galv.
1	Round	⅜ rod	$....	....
2	Round	½ rod	....	....
3	Round	⅝ rod	....	....
4	Round	½ pipe	....	....
5	Square	½ bolt	....	....
6	Square	⅝ bolt	....	....

PIPE CLAMPS

With round head stove bolts

No.	Size, Inches	Per 100 Black	Galv.
1	for ⅜ pipe or ⅝ rod	$....	....
2	for ½ pipe	....	....
3	for ¾ pipe	....	....
4	for 1 pipe	....	....

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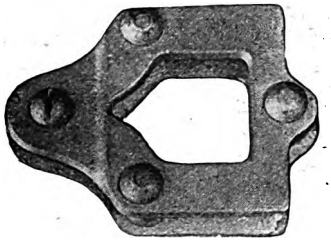
AWNING HARDWARE

FLAT ROLLER SLIDES



No. 7 For ½x1 in. iron, black.....
.....per 100, $....

ROLLER SLIDES

For round iron, with round head stove bolts, for ⅝ in. rod.

Black .....per 100, $....
Galvanized .....per 100, ...

JAW FOOT HINGES

Galvanized

Per 100
No. 1.....$....
No. 2..... ....

AWNING CLEATS

Nos.	1	2	3	4
Length, in.	4½	6	8	10
Galv. ...per 100, $....	....	....	....	....

SLIDE RODS

⅝ in. galvanized iron with forged ends, length 1, 1½, 2, 2½, 3 ft.....
.....per 100 ft., $....

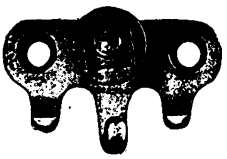
HEAD ROD AND PULLEY HOLDERS

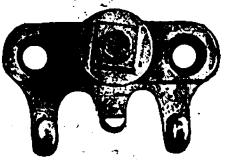
No. 1 No. 1A

For window awnings to be used with ⅜ in. round iron.

No. 1 Galvanized .....per 100, $....
No. 1A Galvanized .....per 100, ...

No. 3 No. 3A

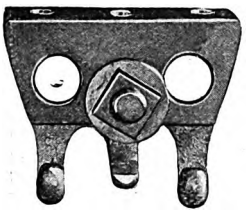


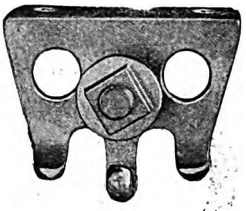


For porch and store awnings, to be used with $\frac{7}{16}$ in. round iron.

No. 3 Galvanized .....per 100, $....
No. 3A Galvanized .....per 100, ...

No. 4 No. 4A





For porch awnings with $\frac{7}{16}$ in. round iron, constructed to screw to the ceiling.

No. 4 Galvanized .....per 100, $....
No. 4A Galvanized .....per 100, ...

STAMPED STEEL PULLEYS

Swivel Eye, Sherardized

Per 100
1 in., Single .....$....
¾ in., Single ....
½ in., Single ....
¾ in., Double ....

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AWNING HARDWARE

HOOK AND EYE TURNBUCKLES

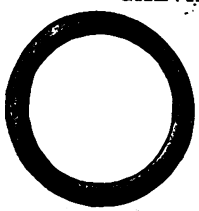
Swivel eye, malleable iron galvanized.

Nos.	1	2	3	4
Diam. screw	3/16	1/4	5/16	3/8
Per dozen .....$....	....	....	....	....

GLASS RINGS

		Per 100
No. 1	Small	.....$....
No. 2	Medium	....
No. 3	Large	....

GALVANIZED RINGS



Size inches, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 1 1/8, 1 1/4, 1 1/2, 1 3/4, 2, 2 1/2.

EGG SHAPE THIMBLES

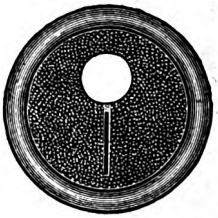
Length, In.		Per Doz.
1 1/2	Galvanized	.....$0.50
1 3/4	Galvanized	..... .60
2	Galvanized	..... .70
2 1/4	Galvanized	..... .80
2 1/2	Galvanized	..... .90
2 3/4	Galvanized	..... 1.25
3	Galvanized	..... 1.75
3 1/4	Galvanized	..... 2.00

CURTAIN KNOBS

For use with 7/16 in. grommet.

No. 2 Japanned iron, 7/8 in. shank..... .....per gross, $....

BUTTON HOLES

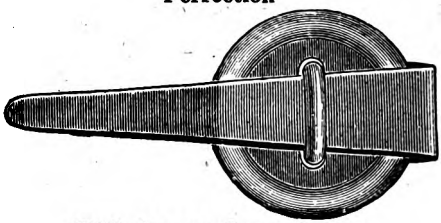


For Curtains

No. 1 Harness leather with metal rim.. ....per gross, $....

CURTAIN PATCHES

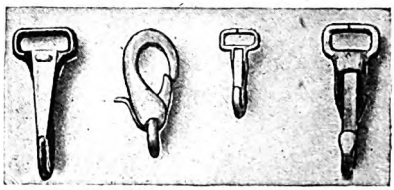
Perfection



With japanned screw eyes

Nos.	4	5
Per gross .....$....		....

SNAP HOOKS



Per Gross

No.	Size, In.	1/2	5/8	3/4	7/8
419	XC plate	.....$1.80	1.80	2.00	...
416	XC plate	....	7.20	7.20	7.20
429	Bronzed	....	2.40	2.40	2.40
429	XC plate	....	3.00	3.00	3.00

No.	Size, In.	1	1 1/8	1 1/4
419	XC plate	.....$...	...	...
416	XC plate	..... 7.20	...	9.40
429	Bronzed	..... 2.40	2.70	...
429	XC plate	..... 3.00	3.25	...

SPRING COTTERS

Size, In.	Per 1000
1/8 x 3/4	....$5.85
3/16 x 3/4	....11.10
3/16 x 1 1/2	....16.20
1/4 x 1 1/2	....27.00
1/4 x 1 3/4	....30.50
5/16 x 2	....52.50
3/8 x 2	....86.40

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AWNING HARDWARE

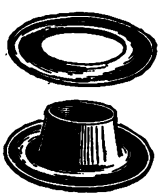
AWNING OR CURTAIN FASTENERS

Single Curtain | Double Curtain | Eyelet and Washer for Nos. 100 and 101 | Washer and Eyelet for Nos. 01 and 03

No. 100	Single curtain, base 1¼x⅜ in.	per dozen,	$0.65
No. 101	Double curtain, base 1¼x⅜ in.	per dozen,	.85
No. 01	Single curtain, base 1 5/16x13/16 in.	per dozen,	1.50
No. 03	Double curtain, base 1 5/16x13/16 in.	per dozen,	1.75

GROMMETS WITH WASHERS

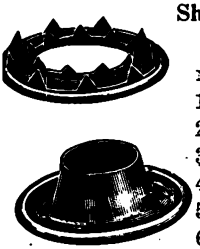
Sheet Brass



Nos.	0	1	2	3
Diam., in.	3/16	¼	⅜	7/16
Per gr..$...	...	...	...	...
Nos.	4	5	6	
Diam., in....	9/16	⅝	⅞	
Per gr.....$...	...	...	...	

SPUR GROMMETS

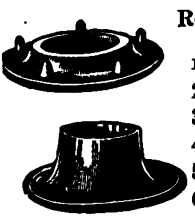
Sheet Brass



No.	Diam. Inches	Per Gross
1	5/16	$...
2	⅜	...
3	7/16	...
4	½	...
5	⅝	...
6	¾	...

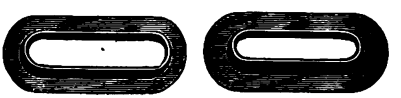
CONICAL POINT GROMMETS

Rolled Rim



No.	Diam. Inches	Per Gross
2	⅜	$...
3	7/16	...
4	½	...
5	⅝	...
6	¾	...
8	1 1/16	...

OBLONG GROMMETS



No. 1 Small, 11/16 in. .....per gr., $...
No. 2 Large, ⅞ in. .....per gr., ...

SETTING DIES

For inserting oblong awning grommets.

No. 1 Small, for 11/16 in. grommet .....each, $...
No. 2 Large, for ⅞ in. grommet .....each, ...

CUTTING PUNCHES

For Oblong Awning Grommets

Small, 11/16 in. .....each, $...
Large, ⅞ in. .....each, ...

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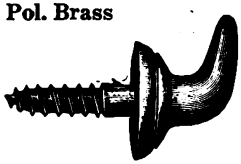
AWNING HARDWARE

GROMMET HOOKS

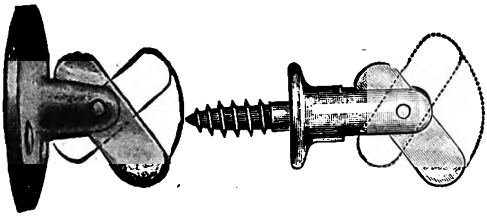
Plain and Pol. Brass



Galvanized and Wrought Brass

Plain brass	per gross,	$5.00
Polished brass	per gross,	7.80
Galvanized iron	per gross,	2.50
Wrought brass	per gross,	5.00

BRASS CURTAIN TOGGLES



With flange or screw base. For making fast curtains where grommets only are used on curtain.

Plain brass	per dozen,	$1.00
Polished brass	per dozen,	2.00

AWNING HOOKS

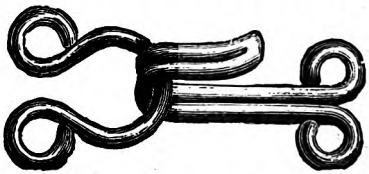
1¼ in., for wood	$...	...
1½ in., for wood	...	...
2 in., for wood	...	...

PIG TAIL HOOKS

Size No.	1	2
Length over all, in.	1½	1⅝
Diam. eye, in.	¼	⅜
Galvanized	per gross, $7.20	7.20
Brass	per gross, 10.00	10.00

HOOKS AND EYES

Large for Curtains and Tents



Hooks and Eyes Complete

Galvanized	per gross,	$3.00
Brass	per gross,	4.00

Hooks Only

Galvanized	per gross,	2.00
Brass	per gross,	3.00

SCREW EYES

Nos.	0	3	5	8	9
Bright, per gr.	$16.00	9.00	5.80	3.30	2.80

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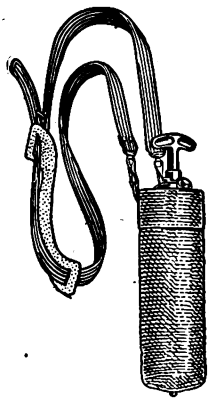
FIRE EXTINGUISHERS

PYRENE FIRE EXTINGUISHERS

With Bracket

With Watchman's Holster



In Metal Box

For homes, stores, warehouses, autos, motorboats, etc.

Damages nothing but the fire. Books, curtains, carpets and the most delicately tinted fabrics are not harmed by Pyrene.

Will put out blazing gasoline, benzine, kerosene and acetylene gas. Water will spread such fires.

Pyrene is a non-conductor, making it safe to use on dynamos, switchboards and other electrical apparatus.

Pyrene never deteriorates. It will not freeze at 50 degrees below zero.

Weighs only 6 lbs., and is so simple that a woman or small boy can use it effectively.

With Bracket, Complete

Brass, black enameled bracket..each, $10.00
Nickel plated, black bracket....each, $11.00

In Metal Box

Boxes are substantially made of metal, painted bright red. They hold one extinguisher and prevent tampering.
Extinguisher, complete with box.....$11.00
Box, separately 1.50

Watchman's Holster

Made of heavy brown canvas, enables Pyrene to be carried over the shoulder.

Extinguisher, complete with holster..$11.00
Holster, separately 1.50
Pyrene Liquid, quart cans.....each, 1.50
Pyrene Liquid, gallon cans.....each, 6.00

U-W FIRE EXTINGUISHERS

Approved by:

Board of Supervising Inspectors of the Steamboat Inspection Service of the U. S. A., for use on steam vessels.

National Board of Fire Underwriters, after an exhaustive and thorough test by the Underwriters' Laboratories, Inc., for general use.

Inspection Department of the Association Factory Mutual Fire Insurance Companies for general use.

To Operate—The tank is filled with water and bicarbonate of soda, and a small quantity of sulphuric acid is suspended in the cylinder. Inverting the Extinguisher creates instantly a gas which not only acts as a propelling power for the liquid, but is in itself a solution which smothers fire, and is forty times as effective as one pail of water.

Furnished in either the red japan, polished copper or nickel plated finish. Prices on application.

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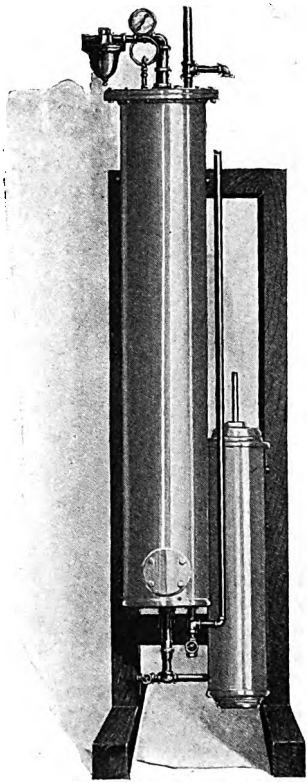
HODGES DRINKING WATER STILLS



SINGLE EFFECT STILLS WITHOUT STEAM GENERATOR

Used Where Clean Steam Is Available

These stills are simple in construction and automatic in operation. They take up little space and are particularly adapted for use on small boats and barges.

The distilled water is delivered to the tank 6 to 10 feet above bottom of still without the use of pumps.

These stills are shipped mounted on brackets with all parts in place ready to run.

The water produced by these stills is equal in palatability to the finest spring water.

Size	Capacity Gals. Per Hr.	Minimum Boiler Pressure	Over All Dimensions Height	Width	Length
J5	5	15 lbs.	5 ft. 6 in.	18 in.	2 ft.
J10	10	15 lbs.	6 ft. 1 in.	18 in.	2 ft.
J15	10	20 lbs.	6 ft. 5 in.	18 in.	2 ft.
J30	30	30 lbs.	5 ft. 10 in.	18 in.	2 ft. 3 in.
J50	50	50 lbs.	6 ft. 8 in.	18 in.	2 ft. 3 in.

Prices on request

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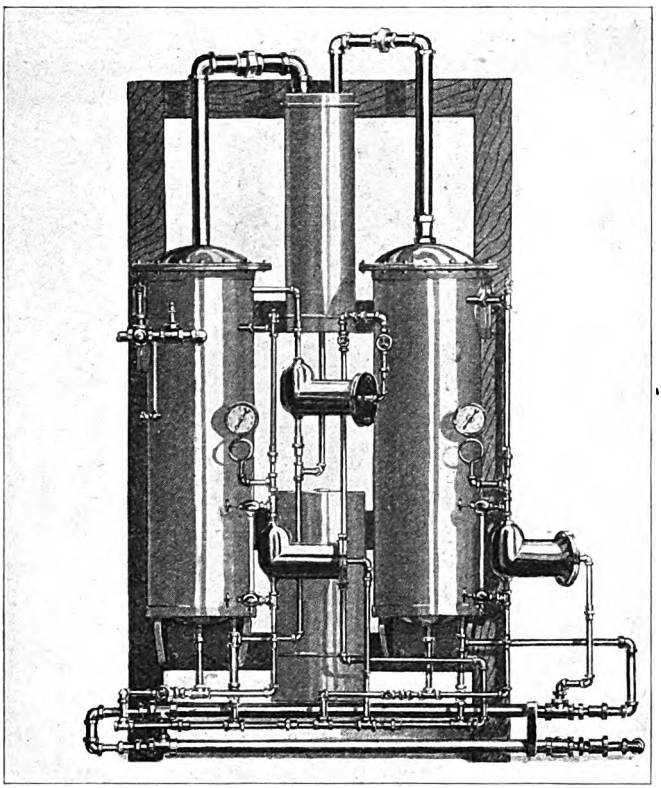
HODGES DRINKING WATER STILLS



SINGLE EFFECT STILLS WITH STEAM GENERATOR

For Use Where Boiler Feed Is Contaminated

These stills are for use where boiler steam is contaminated with oil.

Automatic in operation.

The apparatus is so simple and easy to operate that there are only two valves to regulate—the ones controlling the steam and water supply.

No pumps are required to handle the distilled water as it flows to the tank 6 to 10 feet above bottom of still under its own head.

Quality of water is equal to the finest spring water at all times, irrespective of weather conditions or place at which water is taken on.

Size	Capacity Gals. Per Hr.	Minimum Boiler Pressure	Over All Dimensions Height	Width	Length
J5	5	40 lbs.	5 ft. 5 in.	1 ft. 9 in.	5 ft. 3 in.
J10	10	40 lbs.	6 ft. 1 in.	1 ft. 9 in.	5 ft. 3 in.
J15	15	40 lbs.	6 ft. 9 in.	1 ft. 9 in.	5 ft. 3 in.
J30	30	50 lbs.	6 ft. 9 in.	2 ft. 7 in.	5 ft. 3 in.
J50	50	60 lbs.	6 ft. 9 in.	2 ft. 7 in.	5 ft. 3 in.

Prices on request

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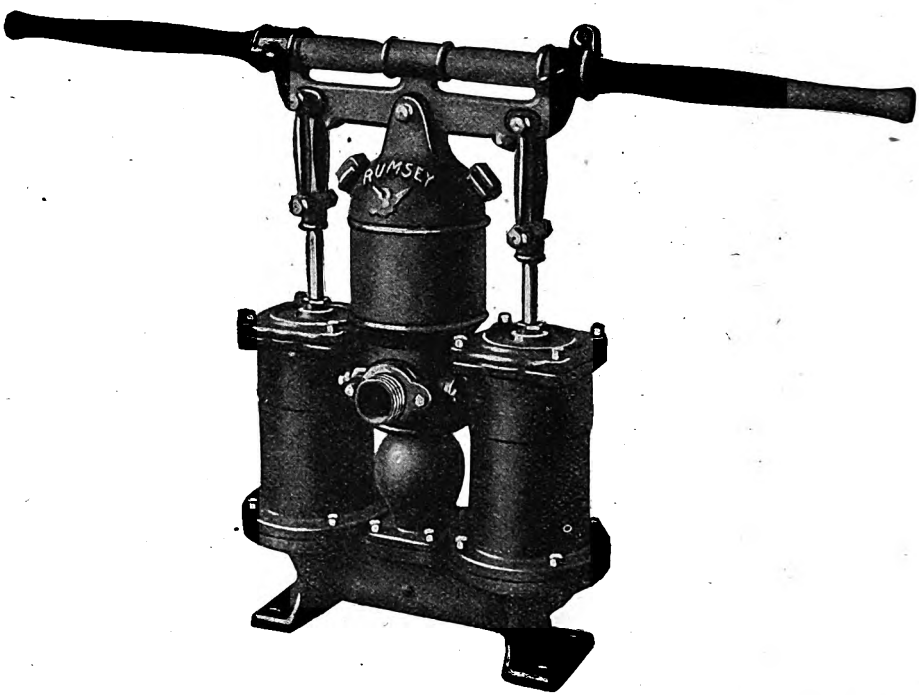
DOUBLE CYLINDER FORCE PUMPS



A compact two-cylinder pump for fire duty and general use. It is the most powerful hand pump obtainable. Size No. 2A answers the government requirement of 100 cubic inches capacity of each cylinder.

This pump is made with bored and polished cylinders, ample air and vacuum chambers, brass cased plunger rods, brass glands and plunger valves. The waterways are large and direct, valves, packings and working parts are readily accessible. The pump is regularly furnished with walking beam and levers of seasoned hardwood but wrought iron folding brakes, for operation by eight or ten men, can be supplied to order at $20.00 extra list. The suction is fitted for pipe and the discharge with half coupling for hose but both suction and discharge may be fitted for either pipe or hose to order.

No.	Diam. Cyl. In.	Stroke Inches	Capacity Per Revolution Gallons	Suction Pipe Inches	Discharge Hose Inches	Approx. Weight Pounds	Iron Cylinders	Brass Cylinders
1	3	6	0.37	1½	1¼	190	$40.00	$60.00
2	4	6	0.65	2	1½	205	55.00	85.00
*2A	4	8	0.87	2	1½	200	60.00	95.00
3	5	6	1.02	2½	2	275	75.00	115.00
4	6	6	1.47	3	2	300	100.00	150.00
5	7	6	2.00	4	2½	400	110.00	170.00

*Size 2A does not have vacuum chamber.

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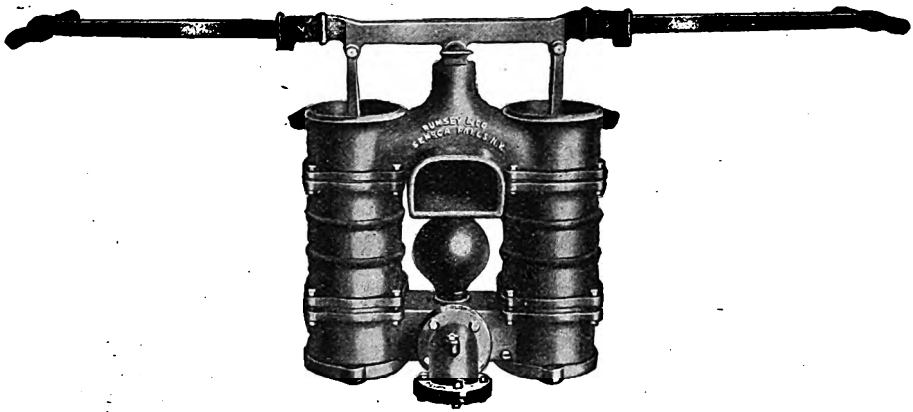
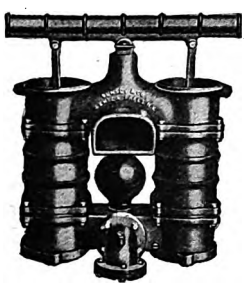
SHIP'S MAIN AND BILGE PUMPS



These pumps are designed for bilge service on board ship. They have a very large capacity and ample waterways so that grain, chips or foreign substances in the bilge will not choke. They are heavily built to withstand rough usage, have no intricate parts to get out of order, are easily overhauled and are primed and ready for service at all times. The cylinders are bored and polished, plungers are brass with clack valves and iron followers. Lower valves are seated in removable valve buckets, fitted into brass valve chambers. Accessible parts, reversible top, rubber buffers, brass sounding plug in suction elbow and vacuum chamber on suction make this a convenient and practical pump. Suction is regularly fitted for iron pipe but can be furnished for hose at extra list.



With Wrought Iron Extension Brake

No.	Diam. Cylinder Inches	Stroke Inches	Capacity Per Revolution Gallons	Suction Pipe Inches	Approx. Weight Pounds	Iron Cylinder	Brass Cylinder
1	5	8	1.36	3	340	$60.00	$80.00
2	5½	8	1.64	3	348	65.00	85.00
3	6	8	1.96	3	385	75.00	95.00
4	8	8	3.48	4	570	115.00	140.00
5	10	8	5.44	5	778	155.00	190.00

If pump is desired with iron walking beam and hardwood levers instead of wrought iron extension brakes deduct $5.00 from above list.

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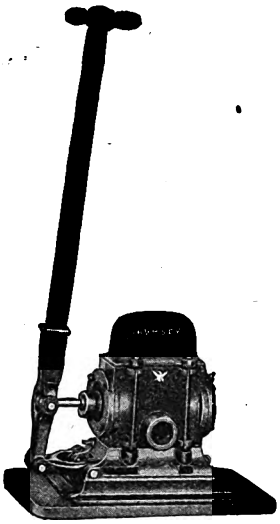
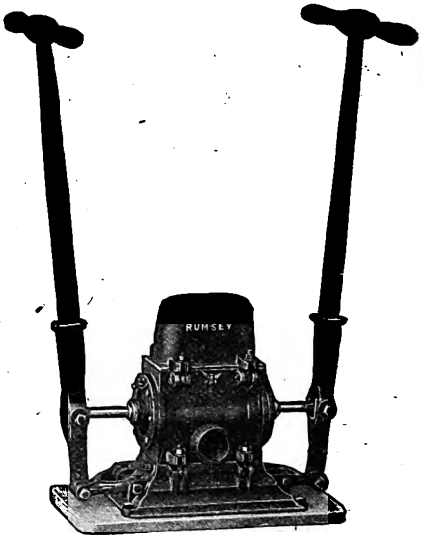
DOUBLE ACTING FORCE PUMPS



One Lever



Two Lever

These are powerful force pumps, durable and easily operated. They are intended for use on board ship, in warehouse, mill or factory, or in private residence for general water supply or fire service. Non corrosive working parts adapt these pumps to handling sea or mine water.

Their construction is simple and they are readily overhauled. They are regularly made with brass lined cylinder, bronze valves and seats, brass cased rod and brass gland. Lever is long and removable from socket. Priming plugs and drip plugs are provided. Suction and discharge are regularly fitted for iron pipe. They can be fitted with brass bushings and half hose couplings for hose connection to order at extra list. The usual hose sizes for three, four, five and six inch pumps are respectively: Suction, 1¼ inch, 1½ inch, 2 inch, and 2½ inch; discharge, 1 inch, 1¼ inch, 1½ inch, and 2 inch.

Note that each lever is attached directly to the piston rod. Some makers of this type have cheapened their construction by the omission of one stuffing box and connect the two levers by a rod which results in misapplication and loss of power.

Five and six inch pumps comply with U. S. government requirements for fire protection for vessels.

One Lever

No.	Cylinder Diameter Inches	Stroke Inches	Capacity Per Rev. Gallons	Pipe Sizes Inches	Approx. Weight Pounds	Brass Lined Each	Brass Cylinder Each	All Brass Each
1	3	5	0.30	1¼	107	$28.00	$55.00	$75.00
2	4	5	0.54	2	117	30.00	60.00	90.00
3	5	5½	0.93	2½	177	40.00	90.00	150.00
4	6	5½	1.34	2½	203	50.00	120.00	185.00

Two Lever*

1	5	5½	0.93	2½	217	$45.00	$95.00	$155.00
2	6	5½	1.34	2½	232	55.00	125.00	195.00

*All parts brass that come in contact with liquid.

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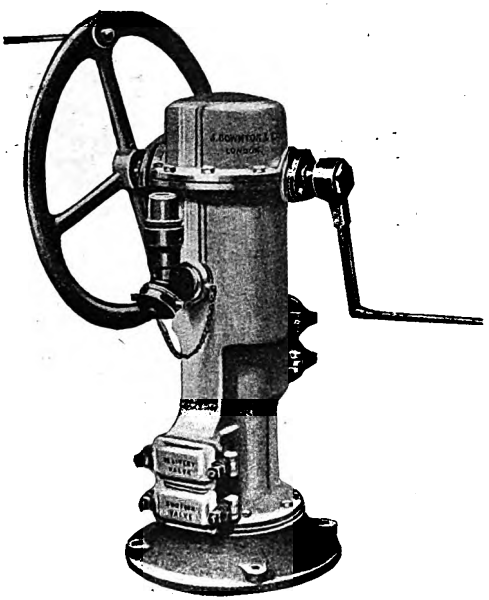
DOWNTON PUMPS

ADMIRALTY PATTERN

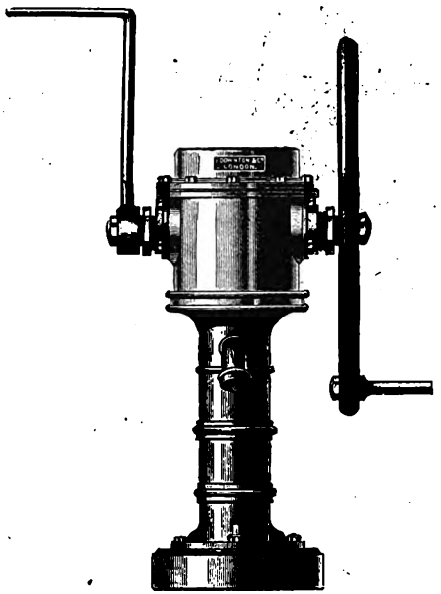


No. 4 Single Piston

With all latest improvements, in all gun metal, with rising main delivery nozzle, blank cap and chain, suction and delivery valve, covers fitted with swing bolts and nuts, mounted on cast iron base with cast iron fly-wheel, wrought iron crank and straight handles.

Diam. in.....	4½	5	5½	6	7
Each .....$....		....	....	....	....

THREE LIFT PUMP



No. 1

Fitted with removable inspection foot valve, turndown delivery nozzle, blank cap and chain, flanged suction, cast iron fly-wheel, wrought iron crank and straight handles, mounted on cast iron base. Fitted with three working buckets. Can be fitted with Rising Main Delivery Nozzles at an extra charge.

Diam in...	3½	4½	5	5½	6	7
Each .....$....		....	....	....	....	....

SUCTION DECK PLATES FOR DOWNTON PUMPS

Arranged to draw from any number of compartments in vessel; made in all gun metal, polished bright, with gooseneck bend, blank caps, suction connections for copper, iron or lead pipes. (Prices on application.)

No. 5A Arranged to draw from 3 and 6 separate compartments; with connections for lead suction pipe.

No. 5 Arranged to draw from 3 and 6 separate compartments; with flanges for iron or copper suction pipes.

NOTE—When writing for prices state whether to draw from 3 or 6 compartments and give diameter of pump.

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CIRCULATING PUMPS

THE LOBEE GEAR AND ROTARY TYPES

Iron and Bronze

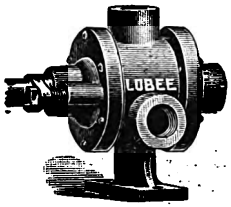


Fig. 1463A, Left Hand
Rotary Type A

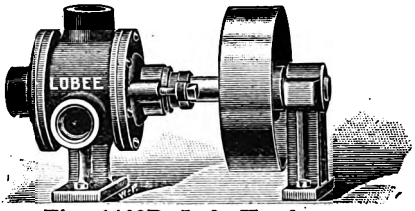


Fig. 1463B, Left Hand
Rotary Type B with Pulley and Upright

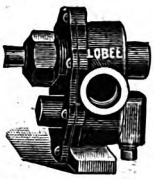


Fig 1463C
Gear Pump with Foot

The Lobee Circulating Pumps are especially adapted for circulating the water or oil on all gasoline motors.

These Pumps give a positive forced circulation and will pump as much in proportion at a speed of 100 revolutions per minute as at a speed of 300 revolutions per minute or more.

They are simple, durable and efficient, and can be operated by pulley, sprocket or gear drive. The suction and discharge can be reversed by reversing direction of rotation. The Gear Pumps are made in bronze only and are strong and durable, having two large bearings for each of the two shafts.

Rotary Type

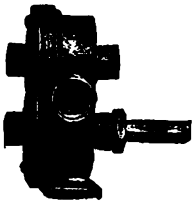
Size of Suction and Discharge Inch	Dimensions Length Including Shaft Height and Width Inches	Capacity in Gals. at 100 R. P. M.	Diameter of Shaft Inches	Type A or B Iron Without Attachments Each	Type A or B Bronze Without Attachments Each
½	7 x4 x4	2	⅝	$ 9.00	$11.00
¾	8x 5x 4½	3½	¾	11.00	15.00
1	10½x9½x4	6	⅞	17.00	21.00

Gear Type

Size of Suction and Discharge Inches	Dimensions Length Including Shaft Height and Width Inches	Capacity in Gals. at 100 R. P. M.	Diameter of Shaft Inches	Bronze Without Attachments Each
⅜	5 x4x2¾	½	½	$6.50
½	5½x4x3	1	½	7.00
¾	6 x4x3	1¾	½	9.00

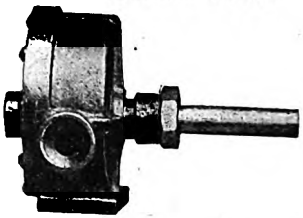
For double shaft, 50c extra. Foot attachment, 25c extra.

BRONZE GEAR ROTARY PUMP



Nos.	62	11H	63	8	53	53S
Size pipe in.	½	½	¾	¾	¾	1
Size shaft in.	½	9/16	½	⅝	⅝	¾
Capacity gals. for each 100 R. P. M.	½	¾	⅞	1⅛	1½	1¾
Each	$5.75	7.25	7.75	11.00	15.00	18.00

BRONZE VANE ROTARY PUMP



Nos.	1	6	7
Size pipe in.	½	¾	1
Size shaft in.	⅝	¾	¾
Capacity gals. for each 100 R. P. M.	1½	4	4
Each	$7.50	18.00	18.00

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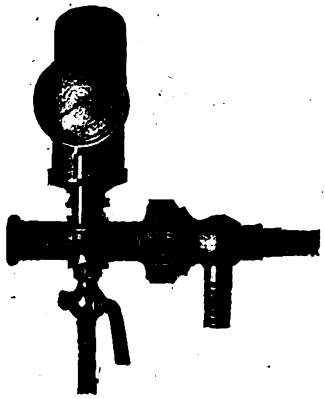
BILGE PUMPS AND BAILERS

AARON AUTOMATIC BILGE PUMP

Polished Brass



Is just as essential in a motor boat as a safety valve on a steam boiler. It prevents the cracking and overheating of engine cylinders, caused by faulty circulation of water by corrosion, or by obstructions of scale in water jackets. It prevents all danger from oil and gasoline explosions pumping out all the gas and vapor after the water has been removed from the bilges in which this danger is ever present from leaking gasoline tanks, piping and carburetors. This gas and vapor seeks the lowest levels in the boat bilges.

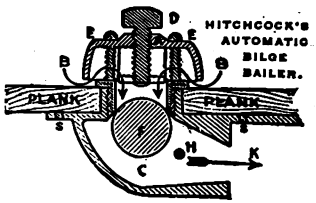
When connected, it requires no further attention after the necessary pressure is raised on this pump. It positively ejects all bilge water, heavy grease or oils and all gas fumes that lodge in the lower bottom of the bilge of the boat thus removing the cause of danger by fire and explosion.

Regular equipment includes: 1 Watchman relief valve, 3 Ejector pressure nozzles, in three diameters; 1 Ejector nozzle socket wrench, 1 Hose nozzle for sediment blow-off hose, 1 Suction strainer.

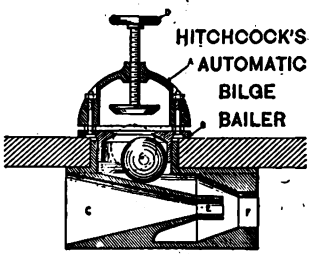
Size, In	Pol. Brass Each	Nickel Plated Each
½	$20.00	$....
¾	25.00	....
1	35.00	....
1¼	40.00	....
1½	50.00	....
2	70.00	....
2½	100.00	....

HITCHCOCK'S AUTOMATIC BILGE BAILERS

Fast Type



Slow Type



The Hitchcock Automatic Bilge Bailers are made entirely of cast bronze. They are automatic in action and require no attention. They take no power from the motor, and are not in the way in the hull. The slow type Bailer is designed for family launches and cabin cruisers. It will bail such boats at a speed from 6 to 15 miles an hour.

No. 0 For fast boats, each.....$5.00
No. 1 For slow boats, each..... 5.00

AUTOMATIC PLUG OR DRAIN

Diameter, inches	¾	1¼
Each	$1.50	2.00

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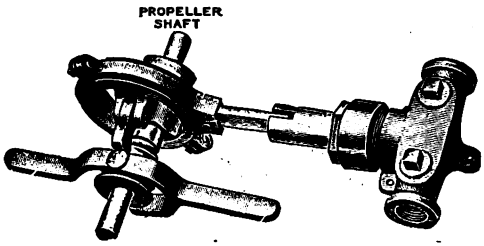
BILGE PUMPS

U-W BILGE PUMP

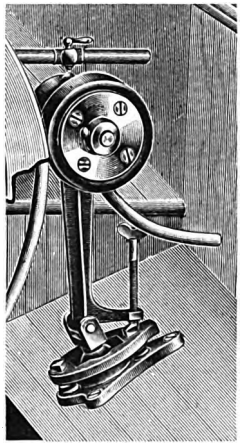


Can be fitted to any size shaft up to 1½ in. diameter. Capacity, 12 gallons per minute at 500 revolutions per minute, bore 1½ in., stroke 2⅛ in.

Shaft runs free in the eccentric when pump is not in use.

Price .....each, $12.50

MOTOR BOAT BILGE PUMP



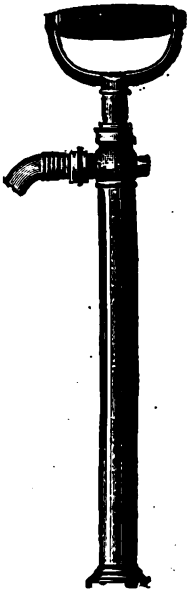
Operated by friction when in contact with fly wheel in motion, adjustable to any floor, will run on either side of fly wheel. Capacity five gallons per minute. Discharges through wall of boat or over the side.

18 inches Suction Hose with screen, and 18 inches discharge hose furnished with each pump.

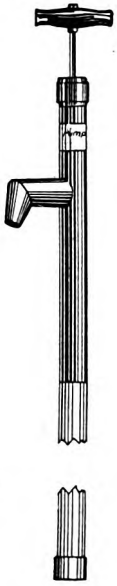
No. 1 All brass.....each, $8.00
No. 2 Brass and iron.....each, 6.00

PORTABLE BILGE PUMPS

Brass



Galvanized



Brass

Polished brass, oak handle, five feet of hose (detachable) with each pump.

Nos.	1	2	3	4
Height inches	16	17	26	26
Diameter inches	1 1/16	1½	1 1/16	1½
Capacity per minute gals.	6	12	8½	16½
Each	$5.00	7.50	5.50	8.00

Galvanized Iron

Length under Spout	36 in.	48 in.	60 in.	Longer per ft.
Diam. 1½ in.	$2.25	2.50	2.75	.55
Diam. 2 in.	2.50	2.75	3.00	.60
Diam. 2½ in.	2.75	3.00	3.25	.65

Larger sizes to order

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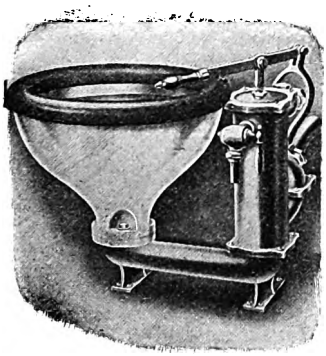
WATER CLOSETS

WINNER CLOSET

The Winner Pump Water Closet for use above or below the water line, Vitro-Adamant flushing rim, hopper bowl. Oak seat with nickel plated brass post hinges, 2½-inch Combination Supply and Discharge Pump. Quick opening supply valve and back water check valve.

Closet as specified with oak seat and cover $30.00

MALTA CLOSET



The Malta Pump Water Closet for above or below the water line, round flushing rim bowl, composition supply and discharge pump, quick-opening supply valve, oak seat, N. P. brass post hinges.

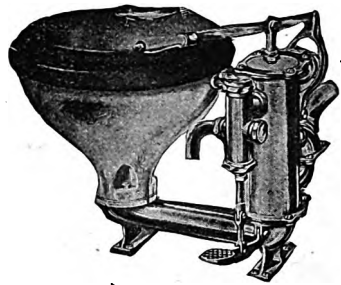
Complete as described, pump rough with finished trimmings $40.00

Dimensions

14 in. back to front, 18 in. wide, 11 in. high to top of bowl, 13 in. high to top of seat.

Weight, with seat, net, 35 lbs.; gross, 70 lbs.; weight, closet without seat, net, 35 lbs.; gross, 65 lbs.

KNOCKABOUT CLOSET



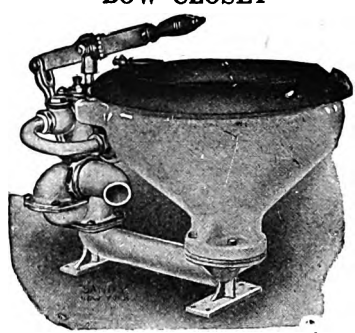
The Most Efficient and Sanitary Small Pump Water Closet Ever Made

Round improved flushing rim bowl, Sands patent composition safety water supply foot valve. Sands patent backwater discharge check valve. Polished oak seat and cover, heavy nickel plated brass post hinges.

Pump rough, finished trimmings, oak seat and cover.....$60.00

Weight: net, 45 lbs.; approximate shipping weight, 75 lbs.

BOW CLOSET



Special Bow Pump Closet, Vitro-Adamant round flushing rim bowl, non corrosive 2½ in. combined supply and waste pump located in the rear with Swingo handle. Quick-opening supply valve, oak seat, N. P. brass post hinges, ¾ in. inlet and 1½ in. outlet. Fitted with patent backwater check valve.

Pump rough, finished trimmings, oak seat $42.00

Dimensions

Space occupied 15x24 in. Front to back 23 in., width 14 in., height 12 in. Weight, net, 35 lbs.; approximate shipping weight 50 lbs.

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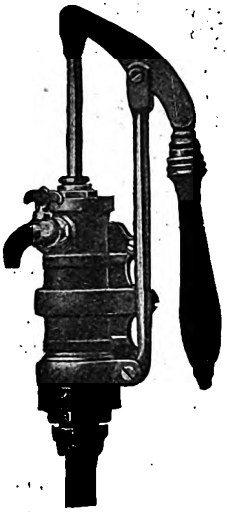
GALLEY PUMPS, SINKS AND SEA COCKS

GALLEY PUMPS

No. F1617 No. F1632



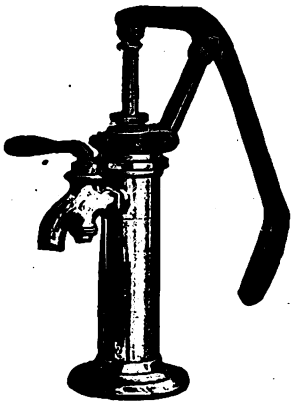
No. F1617—All brass bulk head Galley Pump, 1½ in. cylinder, reversible handle with shut-off cock.

Polished brass .....each, $11.50
Nickel plated .....each, 13.00

No. F1632—Brass pump, wood handle, polished faucet, bulkhead brackets, 2 inch cylinder.

Plain brass .....each, $11.00
Nickel plated .....each, 13.00

No. 1620



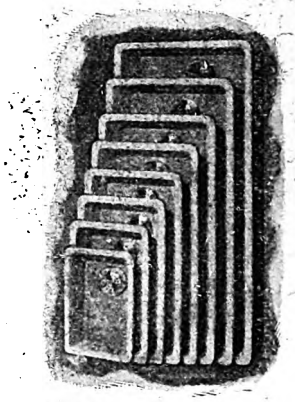
Brass Galley Dresser Pump with polished brass faucet galvanized iron gearing.

2 in. cylinder. ea., $12.00

2½ in. cylinder. ea., 16.50

SINKS

Galvanized and Enameled



Flat Rim Iron Sinks
6 inches deep inside

No.	Size	Galvanized	Enameled
1	12x12 in.	$5.25	$5.25
2	12x16 in.	5.75	5.75
3	12x18 in.	6.85	6.85
4	14x20 in.	8.20	8.20
5	16x24 in.	8.80	8.80
7	18x24 in.	...	...
8	18x30 in.	...	...
10	20x24 in.	...	...

Add for plug strainer..... 1.00

SEA COCKS

Composition Flat Way Sea Cock

¾ in. .....each, $2.75
1 in. .....each, 3.75
1½ in. .....each, 6.00
2 in. .....each, 11.50

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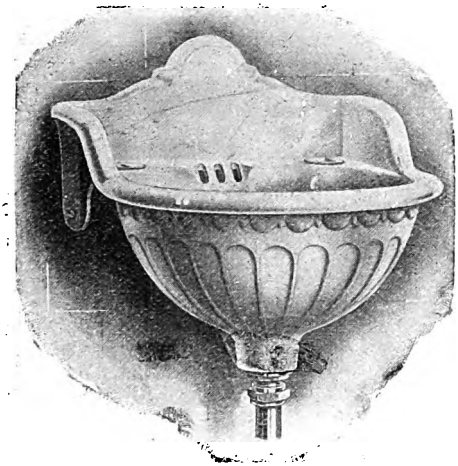
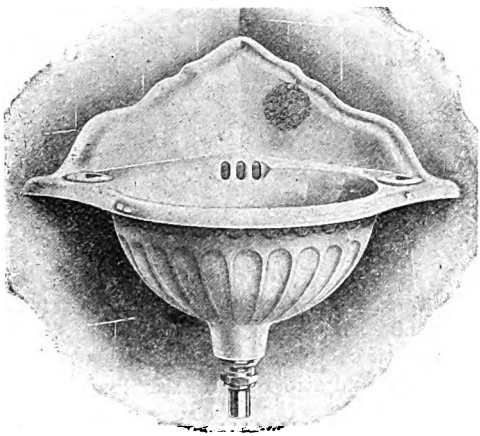
LAVATORIES

APEX



AZEN



Enameled Iron Roll Edge Lavatory, with bowl and back cast in one piece, large patent overflow, nickel plated, cast-brass plug, coupling and rubber stopper.

THE APEX STRAIGHT BACK

Dimensions: Length of back, 13 in., diameter of bowl, 12 in.

Complete, as described, enameled inside $13.50

THE AZEN CORNER PATTERN

Dimensions: Length on side, 12½ in., diameter of bowl, 12 in.

Complete, as described, enameled inside $13.50

ARCO FOLDING

Folding Lavatory, with nickel plated copper lining, nickel plated combined round copper basin and slab, nickel plated copper soap cup, nickel plated composition supply pump, with combination swing supply faucet, nickel plated brass waste and supply couplings.

Complete, oak varnish finish.....$34.75
Complete, mahogany finish..... 37.00

THE GLENWOOD

This lavatory is made with Vitro-Adamant roll rim lipped oval basin, nickel plated copper lining, soap and brush holders, nickel plated brass pump with combination swing supply faucet, nickel plated brass towel rack, nickel plated brass supply and waste couplings, nickel plated brass trimmings.

Quartered oak, polished finished.....$52.00
Mahogany, polished finished..... 57.00

Dimensions: Height 20 in., width 19 in., depth from back to front when closed 6 in., when open 18 in., oval basin 15x12 in.

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HOSE

WATER HOSE

Complete Water Hose Price List

Internal Diam., Inches	2-Ply Conducting Hose, Per Ft.	3-Ply Hydrant Hose, Per Ft.	4-Ply Engine Hose, Per Ft.	5-Ply Engine Hose, Per Ft.	6-Ply Engine Hose, Per Ft.
½	$0.20	$0.25	$0.30	$0.37	$0.45
¾	.25	.30	.37	.46	.55
1	.33	.40	.50	.62	.75
1¼	.42	.50	.62	.77	.93
1½	.50	.60	.75	.93	1.12
1¾	.58	.70	.87	1.08	1.30
2	.66	.80	1.00	1.25	1.50
2¼	.75	.90	1.12	1.40	1.68
2½	.83	1.00	1.25	1.56	1.87
2¾	.92	1.10	1.37	1.71	2.05
3	.99	1.20	1.50	1.87	2.25
3½	1.15	1.40	1.75	2.18	2.62
4	1.32	1.60	2.00	2.50	3.00
5	1.65	2.00	2.50	3.12	3.75
6	1.98	2.40	3.00	3.75	4.50
7	2.31	2.80	3.50	4.38	5.25
8	2.64	3.20	4.00	5.00	6.00
9	2.97	3.60	4.50	5.62	6.75
10	3.33	4.00	5.00	6.25	7.50

(Tank Hose)

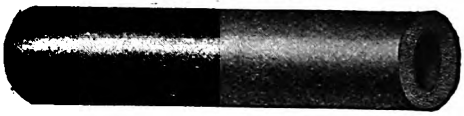
Heavier hose than listed made to order at an advance of 25 per cent on prices of 4-ply, for each additional ply.

WINDING HOSE

Standard list for winding hose with flat, round or half round tinned steel wire, Marlin winding, Marlin woven and cotton woven covers.

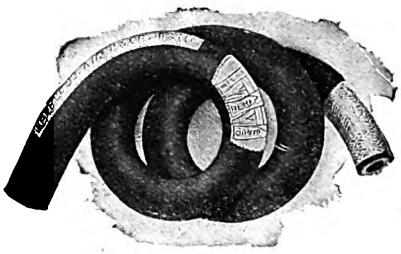
Size Inches	3-Ply Per Foot	4-Ply Per Foot	5-Ply Per Foot	6-Ply Per Foot
½	$0.09	$0.10	$0.11	$0.12
¾	.11	.12	.13	.14
1	.13	.14	.15	.16
1¼	.15	.16	.17	.18
1½	.18	.19	.20	.21
1¾	.20	.21	.22	.23
2	.23	.24	.25	.26
2¼	.25	.26	.27	.28
2½	.27	.28	.29	.30
3	.31	.32	.33	.34

STEAM HOSE



Internal Diameter Inches	3-Ply	4-Ply	5-Ply	6-Ply	7-Ply	8-Ply
½	$0.47	$0.56	$0.70	$0.84	$0.98	$1.12
¾	.57	.71	.87	1.05	1.23	1.41
1	.70	.87	1.07	1.28	1.50	1.70
1¼	.85	1.04	1.30	1.56	1.82	2.08
1½	1.02	1.25	1.56	1.87	2.18	2.50
1¾	1.18	1.45	1.81	2.17	2.53	2.90
2	1.34	1.66	2.07	2.49	2.90	3.32
2¼	1.50	1.87	2.33	2.80	3.27	3.74
2½	1.66	2.08	2.60	3.12	3.64	4.16
3	2.00	2.80	3.50	4.20	4.90	5.60

PNEUMATIC OR AIR HOSE



Airtite

Airtite is the perfect air hose, as it will not kink, bend or get flat after being used a short time. It can be bent double or tied in a knot and still remain "kinkless."

Size, in.	⅜	½	¾	1
2 ply.....per ft.,	$0.34	.38	.47	.57
3 ply.....per ft.,	.38	.47	.57	.70
4 ply.....per ft.,	.47	.56	.71	.87

Special Perfected

Special Perfected is of the perfected construction which makes an exceptionally good pneumatic tool hose—light, strong and durable.

Size, in.	⅜	½	¾	1	1¼	1½
3 ply.per ft.,	$0.38	.47	.57	.70	.85	1.02
4 ply.per ft.,	.47	.56	.71	.87	1.04	1.25
5 ply.per ft.,	.56	.70	.87	1.07	1.30	1.56

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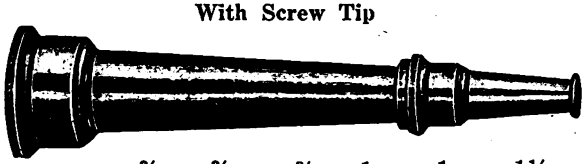
HOSE PIPES AND NOZZLES

HOSE PIPES

With Screw Tip

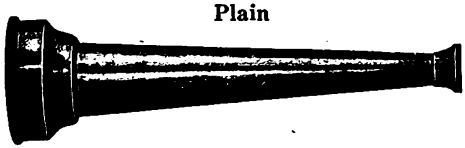


Size, in.	¾	¾	¾	1	1	1¼	1¼	1½	1½
Length, in	6	7½	12	8½	12½	12	15	13	15
Hose thread.....per doz.,	$ 7.00	8.00	10.00	10.00	12.00	20.00	24.00	25.00	30.00
Iron pipe thread, per doz.,	8.00	9.20	11.20	11.20	13.20	21.20	25.00	27.50	32.50
Size, in.	1½	2	2	2	2½	2½	2½	2½	2½
Length, in.	20	12	15	20	15	20	24	30	36
Hose thread.....per doz.,	$36.00	38.00	45.00	50.00	75.00	96.00	100.00	144.00	157.00
Iron pipe thread, per doz.,,	39.00	41.00	48.00	53.00	78.50	99.50	103.50	150.00	163.00

NOTE—Threads on tips of all ¾ and 1-in. screw tip pipes are ⅜-in. iron pipe thread.

HOSE NOZZLES

Plain



With Cock

Plain

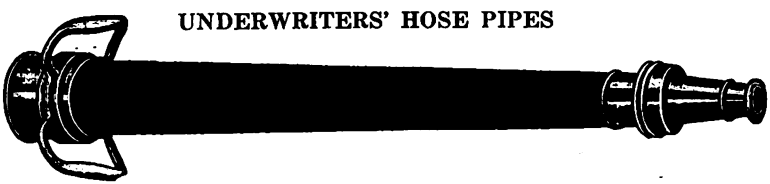
Size, in...	¾	¾	1	1¼	1¼	1½	1½	2	2	2½	2½	2½
Length, in.	3	8	4	4¾	12	5¾	12	6¾	12	7½	12	22
Brass, hose thread, per doz.	$4.00	7.00	5.00	12.00	18.00	18.00	22.00	26.00	34.00	37.40	55.00	92.00
Brass, iron pipe thread, per doz.	5.00	8.00	6.25	13.75	19.75	19.75	24.00	29.00	39.00	39.50	60.00	120.00

With Cock

Size, in.	¾	¾	¾	1	1	1¼	1¼	1½	1½
Length, in.	6¾	8	12	8	12	12	15	12	15
Hose thread.....per doz.,	$11.00	13.00	18.00	15.00	20.00	40.00	50.00	55.00	65.00
Iron pipe thread, per doz.,	12.20	14.20	19.20	18.00	23.00	43.00	59.00	60.00	74.00
Size, in.	2	2	2	2½	2½	2½	2½	2½	2½
Length, in.	12	20	25	12	15	20	24	30	36
Hose thread.....per doz.,	$80.00	110.00	130.00	145.00	155.00	160.00	175.00	195.00	215.00
Iron pipe thread, per doz.,	83.00	113.00	133.00	153.00	163.00	170.00	185.00	205.00	225.00

NOTE—Threads on tips of all ¾ and 1-in. C. L. E. pipes are ⅜-in. iron pipe thread.

UNDERWRITERS' HOSE PIPES



2½ in. butt, 30 in. long.....each, $8.00

Screw nozzle, swivel handle, marlin wound and painted red. This pipe is made in conformity to the requirements of the inspection department of the Associated Factory Mutual Fire Insurance Companies.

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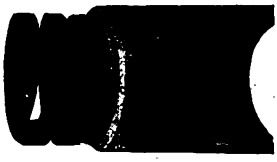
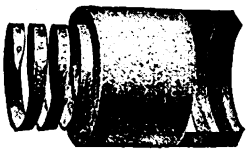
HOSE

SMOOTH BORE SUCTION HOSE



For dirty, gritty water.

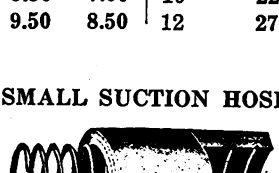
ROUGH BORE SUCTION HOSE



For mining and general contracting work where water is free from grit.

Inside Diam. Inches	Smooth Bore Per Ft.	Rough Bore Per Ft.	Inside Diam. Inches	Smooth Bore Per Ft.	Rough Bore Per Ft.
2	$2.60	....	6	$10.50	$9.50
2½	3.50	$3.10	6½	12.00	10.50
3	4.50	4.00	7	13.50	12.00
3½	5.50	4.90	7½	15.00	13.50
4	6.50	5.80	8	16.50	15.00
4½	7.50	6.70	9	19.50	17.50
5	8.50	7.60	10	22.50	20.00
5½	9.50	8.50	12	27.50	25.00

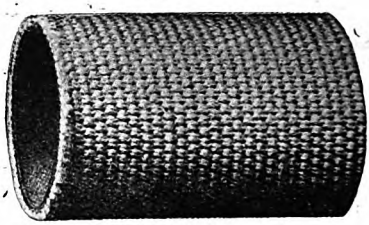
SMALL SUCTION HOSE



Especially for irrigation service, portable engines and any other conditions not requiring a large hose.

Inside Diam. Inches	Spiral Brass Wire Per Ft.	Tinned Iron Wire Per Ft.	Inside Diam. Inches	Spiral Brass Wire Per Ft.	Tinned Iron Wire Per Ft.
¾	$0.77	$0.70	1½	$1.65	$1.50
1	1.00	.90	1¾	2.10	1.90
1¼	1.25	1.15	2	2.50	2.30

COTTON RUBBER LINED FIRE HOSE



Size, in.	1	1¼	1½	2	2½
Per foot	$0.40	.45	.50	.65	.80

UNDERWRITERS' LINEN HOSE

Closely woven from the finest quality linen yarns. Made to conform to specifications of Associated Factory Mutual Fire Insurance Co. and National Board of Fire Underwriters. Will stand a pressure of 400 lbs.

Unlined

Size, in.	1	1¼	1½	2	2¼	2½
Per foot	$0.35	.45	.54	.70	.75	.80

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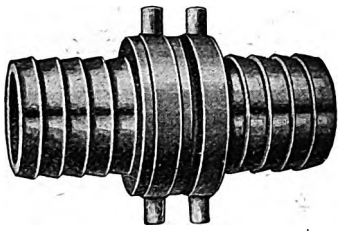
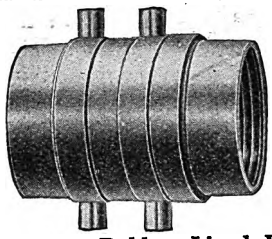
BRASS HOSE COUPLINGS AND CLAMPS

WATER HOSE COUPLINGS



Size Inches	Hose Thread Per Doz.	Iron Pipe Thread Per Doz.	Size Inches	Hose Thread Per Doz.	Iron Pipe Thread Per Doz.
⅜	$2.40	$2.65	2½	$48.00	50.00
½	2.40	2.65	3	60.00	75.00
¾	2.40	2.65	3½	....	120.00
1	4.40	4.65	4	....	150.00
1¼	10.00	10.50	5	....	250.00
1½	14.00	15.00	6	....	500.00
2	24.00	26.00	8	....	600.00

EXPANSION RING COUPLINGS



For Cotton Rubber Lined Hose

Size, in.	1	1¼	1½	2	2½
Number tail ..	7	9	11	12	13
Diam. tail, in..	1 5/16	1 13/32	1 27/32	2 11/32	2⅞
Per set	$2.00	2.50	3.00	3.50	4.00

For Unlined Linen Hose

Size, in.	1	1¼	1½	2	2½
Number tail ..	8	10	14	15	16
Diam. tail, in..	1 3/16	1 15/32	1¾	2 3/16	2¾
Per set	$2.00	2.50	3.00	3.50	4.00

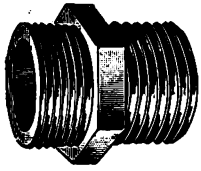
Two expansion rings and a rubber washer furnished with each set.

STEAM HOSE COUPLINGS

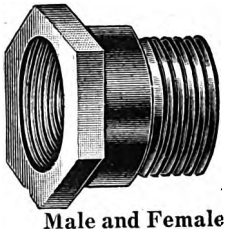
Long Shank, Iron Pipe Thread

Size, in.	¼	⅜	½	¾	1
Per doz.	$15.00	15.00	15.00	15.00	18.00
Size, in.	1¼	1½	2	2½	3
Per doz. ...	$24.00	30.00	42.00	72.00	148.00

REDUCING COUPLINGS



Male



Male and Female

Size, in. ...	½	¾	1	1¼	1½	2
Male, doz..	$3.50	3.50	5.00	9.00	10.00	14.00
Male and fem., doz.	3.50	3.50	5.00	9.00	10.00	14.00

HOSE CLAMPS

Water Hose Clamps

Size hose, in.....	1	1	1	1¼	1¼	1½	1½	2	2¼	2½	3
Ply of hose	2	3	4	3	4	3	4	3-4	3-4	3-4	3-4
Inside diam. open, in.	1 11/32	1 7/16	1 17/32	1 21/32	1 13/16	1 15/16	2 1/16	2 9/16	2⅞	3 1/16	3 15/16
Per doz.	$2.00	2.00	2.00	2.50	2.50	3.00	3.00	4.00	6.50	7.00	10.00

Steam Hose Clamps

Size of hose, in.....	¾	¾	1	1	1¼	1¼	1½	1½	2	2	2½	2½
Ply of hose	3	4	3	4	3	4	3-4	5	3-4	5	3-4	5
Inside diam., open, in.....	1 7/16	1 17/32	1⅝	1 21/32	1 15/16	1 31/32	2 7/32	2 13/32	2 11/16	2⅞	3¼	3 9/16
Per doz.	$2.00	2.00	2.50	2.50	3.00	3.00	3.50	4.00	5.50	6.50	8.50	9.50

NOTE—We can also furnish these clamps galvanized.

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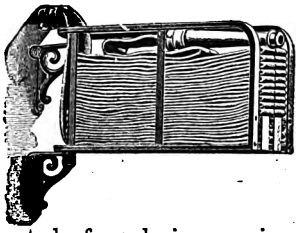
HOSE REELS AND RACKS

WIRT'S STRAIGHT HOSE RACKS



Constructed of angle iron, swings to any angle, frame japanned red.

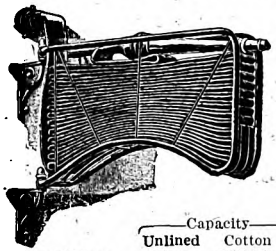
Style U Swinging

No.	Capacity Feet		Size Hose Inches	Size of Rack Hght. In.	Size of Rack Lgth. In.	Each
70	50	Unlined	1¼ or 1½	11	22	$5.00
71	50	Unlined	2	11	22	5.00
72	50	Unlined	2½	11	22	5.00
73	100	Unlined	1¼ or 1½	16	24	6.00
74	100	Unlined	2	16	24	6.00
75	100	Unlined	2½	16	24	6.00
76	150	Unlined	1¼ or 1½	23	28	7.00
77	150	Unlined	2	23	28	7.00
78	150	Unlined	2½	23	28	7.00
79	200	Unlined	1¼ or 1½	34	34	7.50
80	200	Unlined	2	34	34	7.50
81	200	Unlined	2½	34	34	8.00
76	50	Lined	1¼ or 1½	23	28	7.00
77	50	Lined	2	23	28	7.00
78	50	Lined	2½	23	28	7.00
79	100	Lined	1¼ or 1½	34	34	7.50
80	100	Lined	2	34	34	7.50
81	100	Lined	2½	34	34	8.00

Nos. 70, 71 and 72 will be furnished to hold 75 ft. of hose, adding 50 cents to list price. Size, 14x22 inches.

NOTE—Furnished with wall brackets or pipe clamps. If pipe clamps are wanted state size of pipe.

WIRT'S HUMP HOSE RACKS



No.	Size of Hose Inches	Capacity Unlined Linen Feet	Capacity Cotton Mill Hose Feet	Each
A0	1¼ or 1½	50	..	$5.00
A0X	2	50	..	5.00
A00	2½	50	..	5.00
A075	1¼ or 1½	75	..	5.50
A0X75	2	75	..	5.50
A0075	2½	75	..	5.50
A1	1¼ or 1½	100	25	6.00
A1X	2	100	25	6.00
A2	2½	100	25	6.00
A3	1¼ or 1½	150	50	7.00
A3X	2	150	50	7.00
A4	2½	150	50	7.00
A5	1¼ or 1½	200	100	7.50
A5X	2	200	100	7.50
A6	2½	200	100	8.00

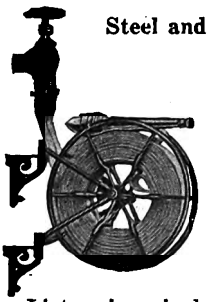
Hump Racks are furnished japanned red unless otherwise specified; furnished in gold or aluminum bronze if desired without extra charge; finished in nickel or copper plate at an additional cost of $2.00 each, net.

For 1 inch hose, A0, A075, A1, A3 and A5 can be specially made without extra charge.

Furnished with wall brackets unless otherwise specified.

List prices include either wall brackets or pipe clamps, the latter not in excess of 4 inch; 5 inch, 35c; 6 inch, 50c; 7 inch, 65c, and 8 inch, 75c per pair net extra.

WIRT'S SWINGING WALL REEL



Steel and Malleable Iron

Style V Wall Reels are furnished in japanned red, unless otherwise specified; finished in gold or aluminum bronze, if desired, without extra charge. Any size plated in nickel or copper, at an additional cost of $2.00 each net; white enamel finish 50c each net.

List prices include either wall brackets or pipe clamps, the latter not in excess of 4 inch. 5 inch clamps, 35c; 6 inch, 50c; 7 inch, 65c, and 8 inch, 75c per pair net extra.

No.	Size of Hose Inches	Capacity Unlined Linen Feet	Capacity Cotton R. L. Mill Hose Feet	Each
0	1¼ or 1½	50	..	$6.00
00	2	50	..	6.00
000	2½	50	..	6.00
0½	1¼ or 1½	75	..	6.00
00½	2	75	..	6.00
000½	2½	75	..	6.00
1	1¼ or 1½	100	...	6.00
2½	2	100	..	6.00
3½	2½	100	..	6.00
2	1¼ or 1½	150	50	6.00
3	2	150	50	6.00
4	2½	150	50	6.50
5½	1¼ or 1½	200	..	7.00
6½	2	200	..	7.50
7½	2½	200	..	8.00

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PACKING

GASKETS

The Crandall gaskets are made with the utmost care and from the highest grade material, to withstand the most severe conditions. From the results obtained, we believe there are none better, if their equal, on the market.

The rubber cement used in Crandall asbestos gaskets is of a nature that combines exceptionally strong adhesive properties, at the same time possessing great heat resisting qualities. A comparison of these gaskets with those of other manufacture will convince you of their value.

It is most essential they be exactly to size, and no pains are spared to have them so.

Ordering—If duplicates of previous orders are desired, you will find on the box "Style No." "Order No." "Division No." "Size." It is well to give all these.

New Orders—If oval, give the two inside dimensions, width of flange, thickness (or ply).

Flat-sided and Diamond—Same dimensions as above, and state flat-sided or diamond.

Round—Give inside and outside diameters, and thickness (or ply).

Gaskets can be stitched on the outside edge, preventing the plies from separating.

GASKETS

Style No. 75—In this style the standard Helios materials are used and is the highest grade of gasket that can be made. The trade name Helios gives this gasket the strongest recommendation that can be expressed. The gaskets qualify for the most rigid government specifications. Wire inserted yarn used both in the warp and the woof.

This is a folded gasket made two, three or four ply, or thicker if desired. The joint is made on a long bevel, firmly lapped and lying absolutely flat. This gasket is covered by the Crandall iron clad guarantee. Made in all sizes for manhole, handhole or mud drum. Also under special style numbers for tube plates, etc. If desired with graphite finish, order Style No. 75B.

Per pound $1.50

Special Styles—The sizes given are standard and can be furnished any width of flange or thickness desired. Special net prices on application.

Style No. 71—This style number is used to indicate a circular gasket made to standard measurements for Heine Tube plates. Strictly Helios grade. Size, 3½x4¼ in. Round, ⅛ in. thick.

Style No. 77—Helios gasket in oval shape for Heine handholes. Standard measurements, 3½x4½x⅜x⅛ in. oval.

Style No. 73—Helios gasket made in square form to standard measurements for Babcock & Wilcox plates. Size, 4¼ I.D.x 4½ I.D.x¼ in., flange ⅛ in. thick.

Style No. 79—Helios gasket in oval form to standard measurements for Babcock & Wilcox handholes. Size 4½x5⅜x ¼x⅛ in. oval.

Style No. 76—Helios gasket made in round form for flange joints, etc. If desired with graphite finish, order Style No. 76B.

Style No. 107—A strictly reliable gasket of the "Keeptite" grade. Good materials, carefully made, second only to the Helios grade Style No. 75. Can be used with perfect confidence as no disastrous results will follow their use.

Made in oval shape in all sizes for manhole, handhole or mud drum. If desired with a graphite finish, order Style No. 107B.

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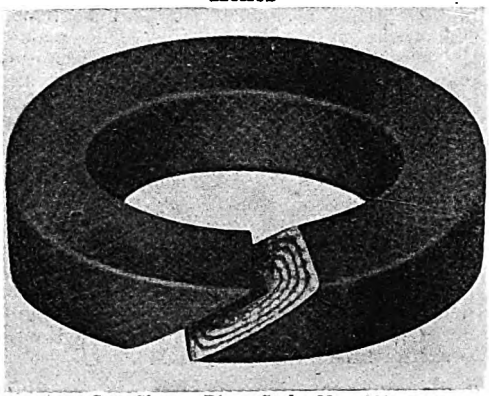
PACKING

HIGH PRESSURE AND SUPERHEAT STEAM PACKING

Helios



Cut Shows Ring Style No. 300

Cut Shows Spiral Style No. 303

Helios packing is an entirely hand made product and is manufactured of the highest quality, commercially pure asbestos cloth wrapped around an exceptionally high grade rubber core, which is compounded to withstand extreme temperatures and resist vulcanization. It is thoroughly lubricated in special high pressure lubrication made from formulae which adds both life and efficiency to the packing.

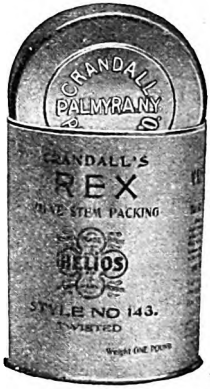
Helios is manufactured with the core in the center and will retain its life and resiliency longer than the majority of packings, for the reason that the heat does not come in direct contact with the core or cushion and cause the same to vulcanize and deteriorate.

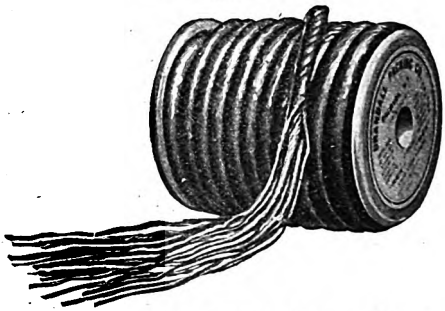
Helios packing will give thorough satisfaction against steam of high pressure as well as against oils and acids; it also has the resiliency necessary for a first class air packing. In use it causes practically no friction and it positively will not blow out, harden or score the rod.

Style No. 300 Ring .....per lb., $2.00
Style No. 303 Spiral .....per lb., 2.00
Style No. 304 Coil .....per lb., 2.00

GENERAL USE STEAM PACKING

Rex





Locomotive cab packing for small valve stems. It is manufactured from a long fibre asbestos yarn, thoroughly impregnated with oil and graphite.

Made in two styles, either braided or twisted, and wound on spools holding ¼, ½, 1, 3 and 5 pounds, each spool enclosed in a metal can to protect against grit and dirt. Made in sizes from $\frac{1}{16}$ in. up in twisted form and from ⅛ in. up in braided form.

Style No. 142 Braided .....per lb., $1.50
Style No. 143 Twisted .....per lb., 1.50

This packing is the same as above styles; only each braid is treated with a vulcanizing cement for heavy duty and is then coated with graphite to prevent friction.

Style No. 312 Braided .....per lb., $1.50
Style No. 313 Twisted .....per lb., 1.50

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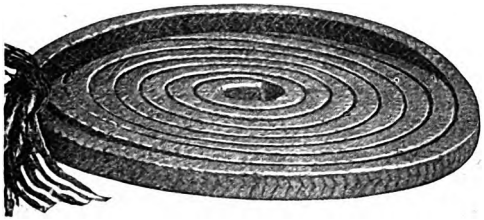
PACKING

GENERAL USE STEAM PACKING



Helios

Made of long fibre asbestos yarn intertwisted with fine copper or brass wire, each strand lubricated and graphited. Then several strands are twisted together. These in turn are braided together after the manner of flax. Gives wonderful results on centrifugal pumps, mine pumps, etc., and in most every condition where soft, strong, heavily lubricated packing is needed. Sold in coil form; or on reels of 25 pounds or more.

Style No. 144 M.Y. Ring ...per lb., $2.00
Style No. 147 M.Y. Coil ....per lb., 2.00

Keeptite

A high pressure asbestos packing made up on the identical lines of Helios, there being only a slight difference in the quality of fibre and material. May be depended upon for perfectly satisfactory service, where conditions are not extreme.

Style No. 500 Ring .....per lb., $1.50
Style No. 503 Spiral .....per lb., 1.50
Style No. 504 Coil .....per lb., 1.50

Royal

Material, make up and service the same as Keeptite Style No. 500, the difference being that a non-vulcanizing red rubber cushion is put at the back instead of in the center of the packing.

Style No. 250 Ring .....per lb., $1.50
Style No. 251 Coil .....per lb., 1.50
Style No. 252 Spiral .....per lb., 1.50

Style No. 565—Designed especially for furnace doors. It is made of long fibre asbestos cloth, reinforced with fine brass or copper wires. Made to withstand severe heat and constant service.

Per pound $2.25

HYDRAULIC PACKING

Fine Duck

Made of fine duck of highest quality and a special composition of white friction. Recommended for service against all pressures of hot or cold water on inside and outside packed pumps.

All sizes ¼ inch to 2 inches square by sixteenths, and can be split as desired. Packed in flat dustproof boxes in very convenient form for carrying in stock.

Style No. 6 Regular $1.50
Style No. 7 Rock hard 1.50

Style No. 8—Material and make up, same as Style No. 6 but stitched with one or more rows of linen thread, to give strength and prevent separation. If desired Rock Hard, so specify.

Per pound $1.70

Tuck's

Square Hydraulic Duck Packing, for all hydraulic work. Made in 12 foot lengths. Fine duck, white friction construction.

Style No. 5.....per lb., $1.00

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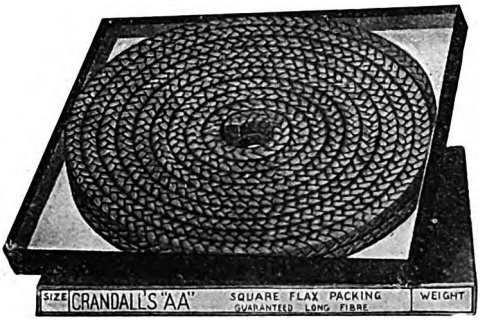
PACKING

HYDRAULIC PACKING



Square Flax

All materials are inspected and selected with greatest care, the idea being to produce a well graded line of uniform and reliable packings suitable to the different needs and conditions.

All grades can be furnished, hard (wax process), soft, plumbago or mica finish, or graphited throughout, as ordered. Furnished medium if not otherwise specified. Wrapped in oilproof paper and packed in dustproof boxes in coils, also furnished on reels.

Style No. 405—The highest grade of extra long fibre guaranteed imported flax. Without exception, the finest grade of square flax in the American market .....per lb., $0.80

Style No. 407—Guaranteed pure flax of long fibre. Fully the equal of most packings sold as extra long fibre.. .....per lb., .60

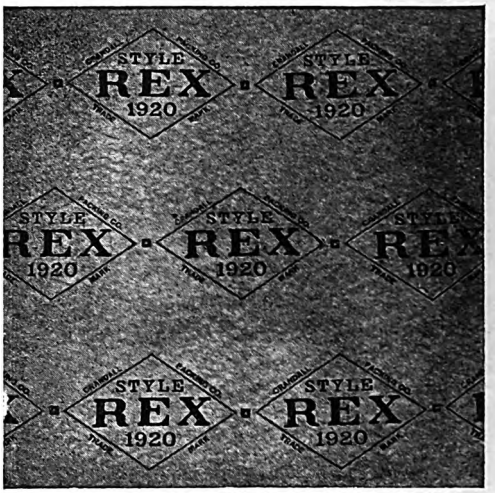
Style No. 409—A good second grade packing. Will give excellent service where a long fibre flax is not required .....per lb., .50

Style No. 411—Well made, lubrication of good quality. Unequaled as a low priced packing .....per lb., .30

Style No. 412—A mixture of flax and jute to meet the demand for a cheaper grade of packing, better than pure jute and not all flax.....per lb., .35

Style No. 413—Frankly, jute. A good serviceable packing for ordinary work .....per lb., .25

SHEET PACKING



Rex

This sheet is composed of asbestos and other heat resisting materials, compressed under high pressure. The stock is laminated, each layer being crossed at 90 degrees resulting in a tougher sheet than when made in usual manner. It is sufficiently soft and pliable to adjust itself to any little irregularities of the plate. Does not become brittle or deteriorate with age. Will give the best results against extreme pressures and temperatures of steam, hot and cold water, ammonia, alkali, acids, oils, etc.

We cannot speak too highly of this sheet. It is unsurpassed by any sheet on the market and a trial will prove its merits.

Thicknesses, $\frac{1}{32}$ in., $\frac{1}{16}$ in., $\frac{3}{32}$ in., and $\frac{1}{8}$ in.

Furnished in sheets 40x120 in., or multiples of same.

Style No. 1920.....per lb., $2.00

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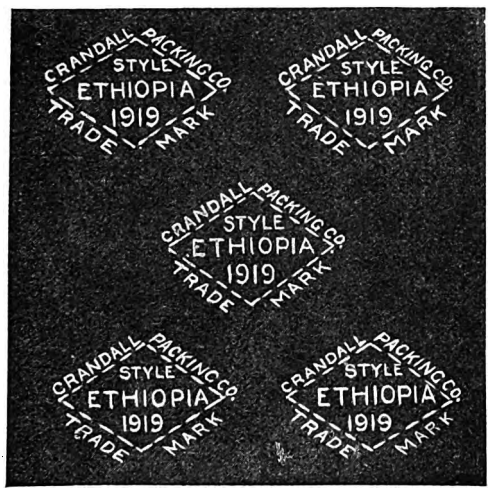
PACKING

SHEET PACKING



Ethiopia

This sheet is the same material and make up as Rex 1920 on previous page, but graphited throughout, preventing adhesion, and can be used repeatedly.

There is no higher grade sheet on the market, and blow-outs are unknown. Unreservedly we can guarantee that users will get full value from this sheet.

Uses and sizes similar to Rex Style No. 1920.

Style No. 1919.....per lb., **$2.00**

Waco

Packs—Water, acid, chlorine, oil. This packing fills the long felt need of a suitable material for the above liquids, and is guaranteed to give satisfactory service. Furnished in any thickness from .015 up, in sheets 36x36 in. and in rolls.

Style No. 1933.....apply for price

SHEET PACKING

Helios

This is an asbestos sheet, made from Helios high grade materials, the same as other Helios packings. It consists of a high grade long fibre wire inserted asbestos cloth, treated with Crandall's high grade cement. Uniformity of this product is guaranteed from the fact that it is made under the personal supervision of men long experienced in the manufacture of this packing. Sheet is made 39 inches wide, any length desired, and thicknesses $\frac{1}{32}$ inch and up, made without wire insertion or with graphite finish, one or both sides.

Guaranteed for severe service on pipe lines, cylinder heads, steam chests, etc., or steam, gas or air, at any pressure.

Style No. 1904.....per lb., **$1.50**

Motorite

Crandall's Motorite is a special sheet made for special service. The basic material is the same in all particulars as that used in Helios sheet, Style No. 1904.

In Motorite the sheet, after being made up, is subjected to a treatment of graphite compound on one side, which prevents adhesion to the cylinder, and the other side is treated with a special dressing which causes adhesion to the plate.

This is a very popular packing in automobile work and is largely used by motor manufacturers, garages, etc.

Style No. 1930.....per lb., **$1.50**

Autorite

Same construction as Motorite except that the grade of material is not as fine.

Style No. 1935.....per lb., **$1.25**

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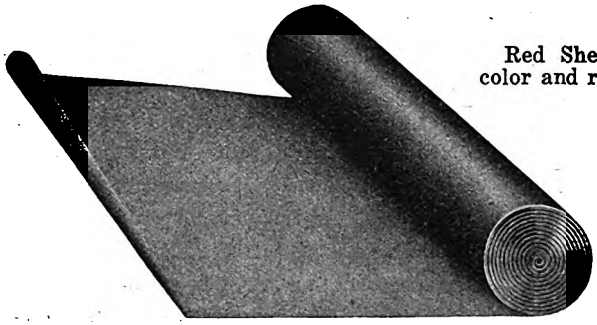
PACKING

PLAIN SHEET PACKING



Red Sheet

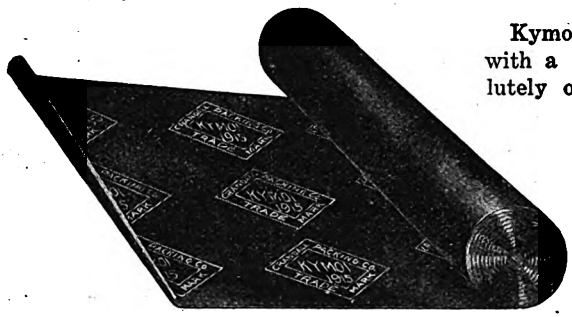
Red Sheet is so named on account of its color and resisting qualities.

Guaranteed to be the equal of the highest grade red sheet packing.

A joint made with this Red Sheet packing will take up any irregularities on rough surfaces, and is not affected by contraction or expansion. A highly satisfactory and economical packing for general use against steam, hot and cold water, etc.

Per Lb.

Style No. 1902—Made 36 in. wide and in 1/32, 1/16, 3/32, 1/8, 3/16 and 1/4 in. thickness.....$1.00



Kymoi

Kymoi sheet packing is jet black in color, with a highly polished surface and is absolutely oil proof. Not affected by ammonia, acids, alkalies, etc., and cannot be hardened or blown out by any steam pressure except superheat.

Kymoi packing weighs lighter to the yard than any other rubber packing and is superior in tensile strength. Can be furnished with cloth insertion if desired.

Per Lb.

Style No. 1915—Made 1/32, 1/16, 3/32, 1/8, 3/16 and 1/4 in. thick in sheets 36 in. wide.....$1.50

REINFORCED SHEET PACKING

Style 1902½—This is made of the same material as Style No. 1902, but with a fine woven brass wire cloth in the center, which gives it added strength. Made 1/32, 1/16, 3/32 and 1/8 thicknesses.. .....per lb., $1.50

Style No. 1915½—Same material as Style No. 1915, treated with wire inserted cloth as above.....per lb., 1.75

Style No. 1911—Especially designed for diaphragms, guaranteed to have tensile strength and flexibility to give long life and good service. Made in three grades, A, B and C, adapted to varying requirements.....per lb., 2.00

Style No. 1901—This is an oil proof sheet similar to Style No. 1915 as shown above. This is guaranteed to give good service under not too severe conditions .....per lb., 1.00

Style No. 1901½—This style is the same as Style No. 1901 except with wire inserted reinforcement as in No. 1915½ .....per lb., 1.50

Style No. 1951—This is the same grade red sheet as Style No. 1902 shown above, but treated with a duck cloth insertion in the same manner as Style No. 1902½ .....per lb., 1.50

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PUMP VALVES

The Crandall line of pump valves embraces a large variety of compounds, each prepared with the single idea of producing a valve, which, when used under the conditions for which it is recommended, can be guaranteed to seat properly, not to chip on edges and to give the maximum of wear and reliability.

In describing the various styles, we have provided information, consideration of which will enable purchaser to select a valve that will exactly meet his requirements as to quality, degree of hardness and density.

In ordering valves of large diameter, be sure to specify heavier thickness than for small valves.

We invite inquiries regarding valves for special service not here covered. We can furnish valves with raised spring guards and with metal bushings to prevent wear around studs.

COLD WATER VALVES

Any valve shown under this head should not be used against water when temperature is constantly above 60 degrees. We advise the use of a medium hard valve, unless guard is curved.

Style 1632—A very dense, medium hard stock, for pressures up to 600 pounds. Will not bend or break no matter how severe the service. Excellent for mine pumps with long lifts and against muddy or gritty water.

Style 1625—A medium soft but very tough compound. Any pressure up to 500 pounds. The best valve for high duty, where conditions do not favor the use of a medium hard valve. Grit or dirt will neither cut nor prevent its seating.

Style 1620—Standard cold water valve for pressure from 150 to 350 pounds. Made medium hard to meet all regular conditions.

Style 1600—Medium soft. A good all around valve, where pressure is not over 150 pounds.

COLD WATER VALVES

Style 1610—Medium soft stock not recommended where pressure exceeds 80 pounds.

Style 1605—Soft valve for curved guards. Pressure limit 175 pounds.

Style 1640—Is a tough, medium soft, white stock for pressures up to 250 pounds.

Style 1638—First class, medium soft, red compound. Very satisfactory for pressures up to 200 pounds.

Balata Valves

We carry a full line of Balata valves for cold water only.

WARM AND COLD WATER VALVES

Style 1615—Is a hard, tough valve, for pressure up to 400 pounds. Not affected by warm water up to 120 degrees, but still sufficiently flexible to seat where temperature is lower.

HOT WATER VALVES

Style 1515—Granite Compound for highest temperatures and pressures. A hard valve which is always "at home" against boiling water.

Style 1500—A hard, high grade valve for Standard service. Good for pressure up to 250 pounds and highest temperatures.

Style 1510—Hard, for pressure up to 200 pounds and up to 200 degrees temperature.

Style 1520—For pressure not over 200 pounds. A hard compound not recommended where temperature exceeds 180 degrees.

CONDENSER VALVES

These valves are made very soft, tough and light to withstand the heat and constant bending of condensing service. This class of valve is sometimes called Marine as they are largely used on steamships, etc.

Style 1705—Superba Compound. Guaranteed to be the best. Made either red or gray.

Style 1700—Marine Compound, made gray only, for high duty afloat.

Style 1720—Standard Red Condenser Valve, for general use.

Style 1710—For ordinary service.

Style 1715—For light duty.

AIR VALVES

Style 1750—Soft stock for air pumps.

Prices quoted on application.

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PACKING, OAKUM AND WASTE

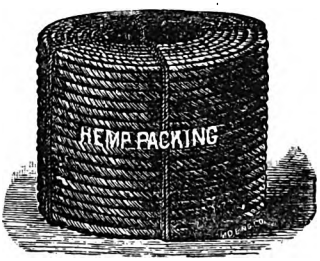
PACKING

Square Flax

Made of long line flax free from hemp or jute, thoroughly lubricated. 10 to 12 lbs. in a box.

¼ to 2 in.....per lb., $....

Hemp Packing

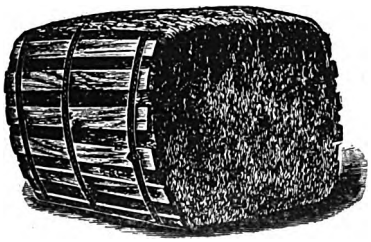


American hemp, dark.....per lb., $....
Italian hemp, light.....per lb., ...
In 25 Lb. Coils

Jute Packing

Plain .....per lb., $....
Tarred .....per lb., ...
In 50 and 100 Lb. Coils

OAKUM



Best unspun .....per bale, $....
Best spun .....per bale, ...
Navy .....per bale, ...
U. S. Navy .....per bale, ...
Plumbers' spun .....per bale, ...
Plumbers' spun and coiled...per bale, ...

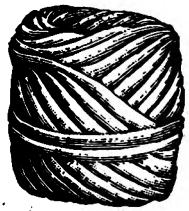
SPUN COTTON

In 100 Lb. Bales

Yacht, 5 ply .....per lb., $....
Navy, 3 ply .....per lb., ...

WICK PACKING

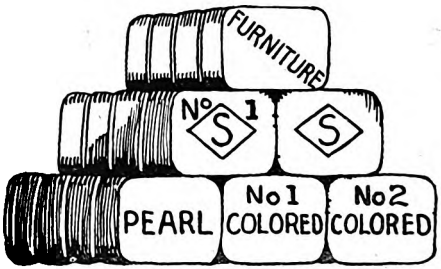
Cotton



Asbestos

Cotton wick .....per lb., $....
Asbestos wick, twisted, acid and fireproof, in ¼, ½ and 1 lb. balls.per lb., ...

COTTON WASTE



Clean and free from grit. Put up in 1 and 5 lb. packages, and 50, 125 and 500 lb. bales.

Furniture .....per lb., $....
No. 1S .....per lb., ...
S .....per lb., ...
Pearl .....per lb., ...
No. 1 colored .....per lb., ...
No. 2 colored .....per lb., ...

WOOL WASTE

Colored, in 125 lb. bales.....per lb., $....

WIPING RAGS

Washed and sterilized

All white .....per lb., $....
Colored .....per lb.,
In 50 and 100 Lb. Bales

ZEPHYR YARN

Balls .....per lb., $....
Skeins .....per lb., ...

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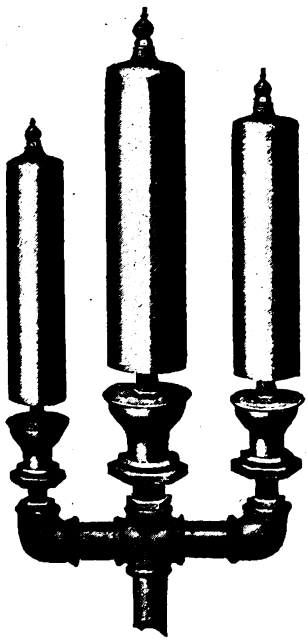
WHISTLES AND VALVES

STEAMSHIP WHISTLES



Single

Copper bell, iron base, brass fittings.

Diam. Bell, In.	Length Bell Inches	Size Pipe Inches	Each
4	18	1½	$....
6	20	1½	....
8	30	2	....
8	48	2½	....
10	30	2½	....
10	36	2½	....

Chimes

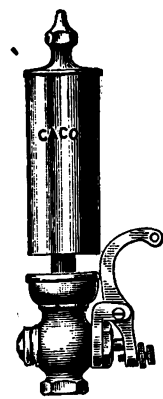
We are prepared to make chimes of any description to order and will be pleased to quote prices on receipt of specifications. Inquiry should give size of pipe connection and approximate size of largest whistle, the other whistles will be selected to chime harmoniously.

CACO SINGLE TONE WHISTLE

This is a single tone whistle, 1½ in. diameter, and has a very clear and penetrating blast. It is fitted with regular thumb screw adjustment, by which means a uniform blast can be maintained regardless of air or gas pressure.

Can be furnished for ¼ in. or ⅜ in. iron pipe—female.
With lever .....each, $4.00
Without lever ...each, 2.00

CACO CHIME WHISTLES



Made in two sizes, 1½ in. and 2 in., with and without lever valve.

These whistles, due to their peculiar construction, have a unique and distinctive blast.

The lever whistles are fitted with an adjustable valve, and due to this adjustment only the necessary amount of air is consumed regardless of pressure

No.		Each
22	1½ in., with lever valve	$5.00
14	1½ in., without lever valve	3.00
30	2 in., with lever valve	7.00
11	2 in., without lever valve	5.00

N. B.—The 1½ in. whistles are tapped for ¼ or ⅜ in. iron pipe. 2 in. whistles are tapped for ½ in. iron pipe.

BALANCED WHISTLE VALVES

Extra Heavy Cast Bronze

Nos.	203 Scwd.	204 Flgd.	205 Scwd.	206 Flgd.
Size, in.	2½	2½	3	3
Each	$....	....	....	....

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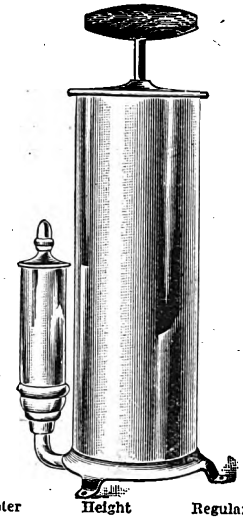
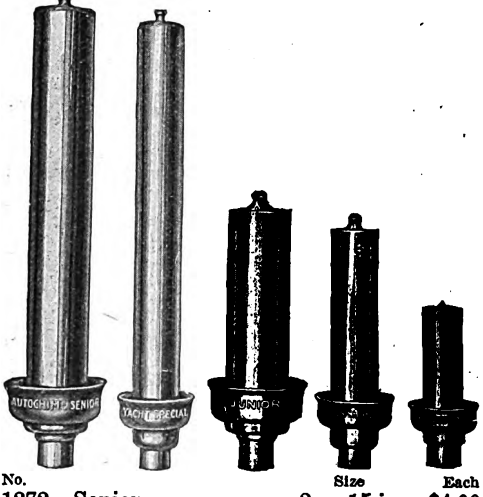
WHISTLES AND VALVES

LAUNCH WHISTLES
Polished Brass



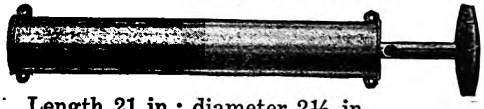
Size	Diameter	Height	Regular	Chime
0	3 in.	14 in.	$6.00	$6.50
1	4 in.	15 in.	7.00	7.50
2	4 in.	20 in.	9.00	9.50

AUTO CHIME WHISTLES
For Air, Steam or Burnt Gas Pressure



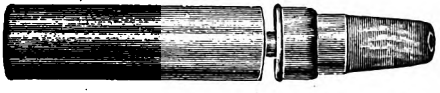
No.		Size	Each
1272	Senior	2 x15 in.	$4.00
1273	Yacht special	1½x15 in.	3.50
1274	Junior	2 x 9 in.	3.00
1275	Launch special	1½x 8 in.	2.50
1276	Midget	1¼x 5 in.	1.50

LAUNCH WHISTLES
Ereful, Polished Brass



Length 21 in.; diameter 2½ in.
Each $5.00

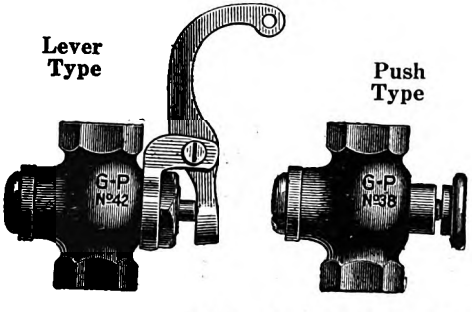
FULL TONE BOAT WHISTLES



Pocket size, nickel plated. To be blown by mouth. Will give a loud blast from 4 to 6 seconds, as required by law. Can also be attached to compressed air tank or steam pipe, by removing wooden mouthpiece.
Length 6¾ in.; diameter 1⅛ in.

Each $2.00

WHISTLE VALVES
For Air and Gas



A valuable accessory on any motor boat. Can be placed conveniently on pipe line between tank and whistle. We guarantee all our valves to be absolutely air tight, and use soft seats for air; ground seats for gas.

Lever Type

	⅜ in.	½ in.
Male and female ends	$2.60	$3.10
Female both ends	2.60	3.10
Male both ends	2.50	3.00

Push Type

	⅜ in.	½ in.
Female ends	$2.40	$2.50
Male and female ends	2.30	2.40

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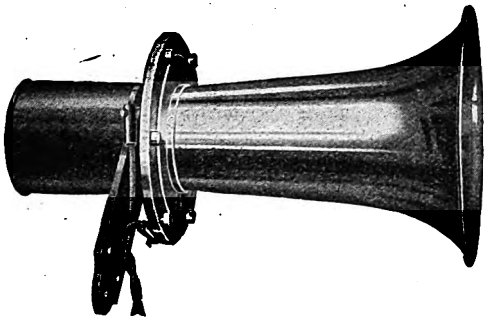
HORNS AND WHISTLES

No. 16 VICTOR HORN
Vibrator Type



The Best Cheap Electric Horn Ever Produced

This electric horn is built on pleasing lines to meet the demand for a good cheap horn.

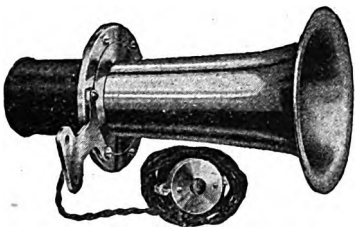
The tone is positive and insistent, clearing the road instantly.

Price is complete with push button, 10 feet of cord and mounting bolts. Furnished in all black, black and nickel, or black and brass finishes, as specified.

Price .....each, $4.00
M83 Motor boat mount.....extra, 1.00

Extension tubes are not sent with horn unless so ordered.

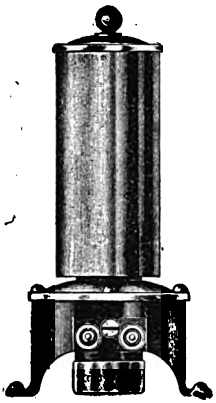
No. 23 SAMSON JR. MOTOR DRIVEN HORN



A most wonderful toned electric horn with fewer parts than any other motor driven horn on the market, simpler in construction, hence longer lived. All parts correctly proportioned so as to make it the neatest and most attractive appearing horn.

Price, complete with push button, 10 feet of cord and mounting bolts, operates off 6 dry cells.....$10.00
M83 Motor boat mount.....extra, 1.00

THE RUSSELL MARINE WHISTLE
Is a Winner



Regular Finish

Baked-on black enamel base, with highly polished brass whistle lacquered, or all black base and whistle, with black push button and wire.

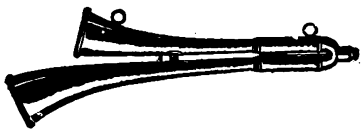
Operated by dry or storage batteries, 6 to 10 volts. Stands 8 in. high over all.

Complete outfit, including base with automatic connections, whistle, in either finish, special waterproof push button, 50 feet weatherproof insulated wire,

Price each $5.00

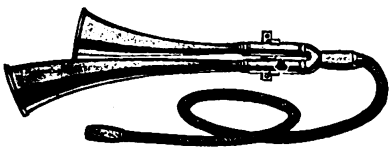
SIGNAL TWO-TONE HORN

With mouthpiece. Made in highly polished brass and nickel plated. Length 10¼ inches.



Style D. Is arranged with rings for fastening cord as shown in illustration.

Style E. Is arranged with bracket to screw to deck or coaming, and blown through our special removable extension tube.



	Polished Brass Each	Nickel Plated Each
Fig. 1294D	$2.25	$2.50
Fig. 1294E	2.25	2.50
Fig. 1294F	3.00	3.25

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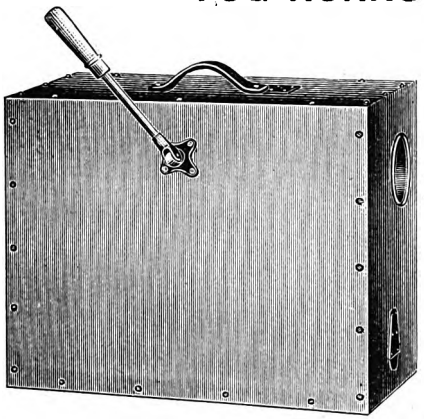
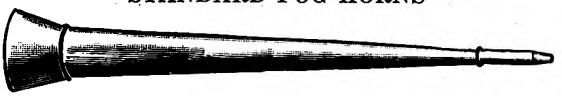
FOG HORNS AND MEGAPHONES



LOTHROP'S PATENT FOG HORNS

Nos.	00	0	1	2	3
Type	Siren	Double	Vessel	Yacht	Boat
Hgt., in.	19¾	16⅝	16⅝	16½	10¼
Lgth., in.	30	20¾	20¾	18⅛	17½
Wdth., in.	12	10½	9½	9¼	8¾
Wt., lbs.	51	30	27½	24½	19½
Each	$50.00	20.00	15.00	13.00	12.00

STANDARD FOG HORNS

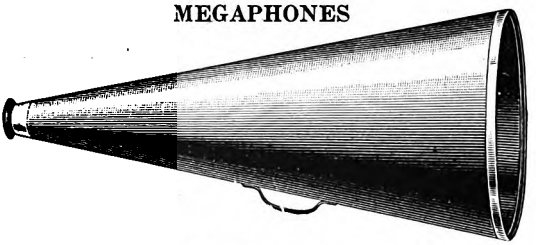


Tin, Galvanized and Polished Brass

Wood Mouthpiece and Brass Reed

Length, in.	20	24	30	36	40
Tin	$5.00	$5.62	$6.25	$7.50	$9.50
Brass	10.00	11.50	13.50	15.00	20.00
Galvanized	12.00	13.00	14.50	15.50	20.50

MEGAPHONES



For transmitting and receiving the voice, indispensable for yachts, towboats, steamships, country and seashore houses, hotels, etc.

Zinc

Length, inches	15	30
Each	$2.00	$3.00

Fibre Horn, Nickel Trimmings

Nos.	1	1½	2	2½	3	5	7
Length, inches	15	22	30	34	40	48	60
Each	$1.50	2.00	2.50	3.00	3.50	7.00	10.00

Rope, pulley and cleat for suspending Nos. 3, 5 or 7 ..... .75

Stand for Nos. 3, 5 or 7 ..... 2.50

Aluminum

Nos.	1A	2½A
Length, inches	18	34
Each	$3.50	$8.00

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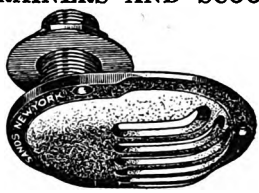
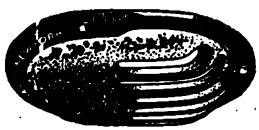
STRAINERS, EXHAUST CONNECTIONS, ETC.

STRAINERS AND SCOOPS



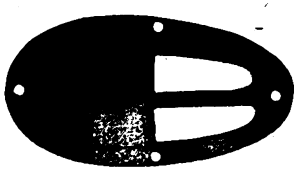
All cast bronze heavy pattern combination inlet connection, with strainer and scoop.

Size Inches	Iron Pipe	Lead Pipe
½	$2.25	$2.75
¾	2.50	3.00
1	3.00	3.50



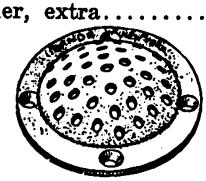
A splendid cast bronze heavy pattern strainer. Flange is drilled for screws.

No.	Size	Each
1	2½x3½	$0.50
2	2 x4	.75
3	3¾x5	1.00



Size 2¾x5 in.

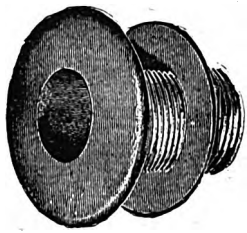
Plain brass	each,	$0.30
Polished brass	each,	.36
With strainer, extra	each,	.20



All cast bronze round raised strainer, improved heavy pattern with self-cleaning perforations. Used on water supply for any and all purposes. Flange is drilled for screws.

No.	Diam., In.	Each
1	2½	$0.35
2	3	.50
3	4	.65
4	5	1.00
5	6	1.50

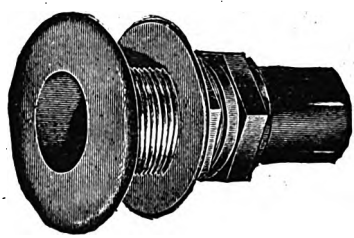
EXHAUST CONNECTIONS



Plain Brass

Size pipe, in.	¾	1	1¼	1½	2
Each	$1.50	2.00	2.50	3.50	4.50

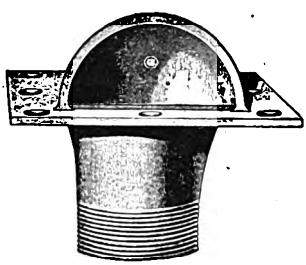
INLET AND OUTLET CONNECTIONS



Plain Brass

Size pipe, in.	¼	⅜	½	¾
Each	$0.75	1.00	1.50	2.00
Siz pipe, in.	1	1¼	1½	2
Each	$2.50	3.00	4.00	5.00

UNDER WATER EXHAUST



Brass

Size No.	For Pipe Inches	Each
0	1½	$2.50
1	2	3.00
2	2½	4.25
3	3	6.00

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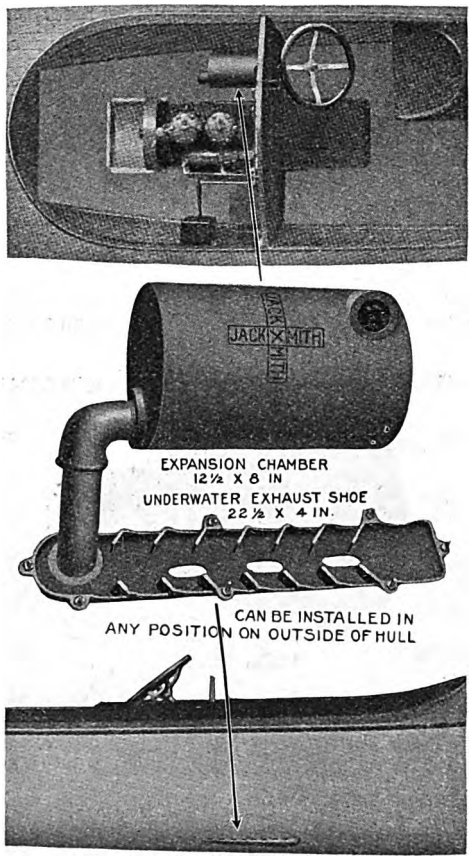
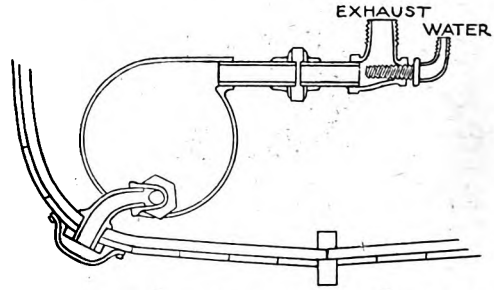
MARINE MUFFLERS

THE GORDON SILENCER AND UNDER-WATER EXHAUST





The above cut shows the usual method of installation.

Outfit Includes

Expansion chamber, under-water exhaust shoe, pipe with locknut for connections through the hull. Street L on expansion chamber. Outboard pipe connection on expansion chamber 1½ in. for engine exhaust 2 in.

The expansion chamber or silencer can easily be installed in any convenient place in the boat. Under a seat or locker.

The under-water exhaust shoe should be placed as near as possible to the silencer at a point lower than the bottom of the silencer.

With this installation all overflow water from the engine can be led directly into the pipe which leads from the exhaust manifold to the silencer, or directly into the silencer, all pipes leading downward.

The water flowing into the chamber not only keeps it cool, but condenses the gases.

The under-water deflector shoe forms partial vacuum at the outlet, allowing a free expansion which overcomes all noise, back pressure, vibration and pounding.

All exploded gases being carried under water makes the boat entirely free from unpleasant odors or greasy spray.

The cost of this entire outfit is less than a high-class muffler and under-water exhaust. It is easily installed at minimum expense. Does not take up very much room in your boat, and in case you cannot install it under a seat or locker it is not unsightly.

Authorities in motor boating centers are forcing the use of a device which will eliminate noise and which will necessitate every launch being equipped.

Furnished right or left inlet on expansion chamber.

With fresh or salt water fittings.....F. O. B. Cleveland, $12.00

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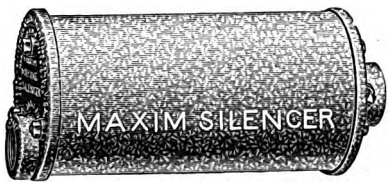
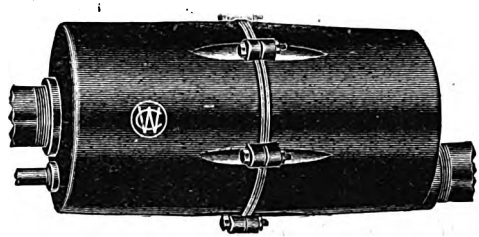
MARINE MUFFLERS

MAXIM SILENCERS

Galvanized



Cast Iron



Galvanized Sheet Toncan Metal, for Fresh Water

Model	Diameter of Cylinder or Bore of Motor Inches	Exhaust Inches	Length Inches	Diameter Inches	Weight Pounds	Price
A	2¾ to 3	1, 1¼, 1½	7	6¾	15	$6.00
B	3¼ to 3½	1, 1¼, 1½, 2	8	6¾	16	6.25
D	3⅝ to 3¾	1, 1¼, 1½, 2	10	6¾	17	6.50
F	3⅞ to 4¼	1, 1¼, 1½, 2	15	6¾	21	8.50
H	4⅜ to 4⅝	1, 1¼, 1½, 2	17	6¾	24	9.50
K	4¾	1, 1¼, 1½, 2	18	6¾	25	10.00
M	4⅞ to 5¼	2, 2½	20	8	35	13.00
P	5½ to 5⅞	2, 2½	20	8	36	13.25
S	6 to 6½	2, 2½	22	8	38	14.00
V	6⅝ to 7	2, 2½	24	8	41	15.00
X	7⅛ to 7½	2, 2½	26	8	43	15.75

For an exhaust ½ in. larger than any of the sizes listed the Silencer will be 1 in. larger in diameter, and the list price will be $1.50 higher.

For six cylinder motor add 1 in. to bore before selecting.

Blacked Cast Iron, for Salt Water

*Model	Bore or Diameter of one Cylinder Inches	Length Inches	Diameter Inches	Weight Pounds	Exhaust Inches	Price
B	3 to 3⅞	13	6¼	22	1½	$5.00
F	4 to 4⅞	15½	7¼	30	2	6.75
M	5 to 5⅞	16¼	8¼	38	2½	8.00
P	6 to 6⅞	18¼	8¼	46	2½	10.50
V	7 to 7½	18¾	9¼	54	3	14.00
Y	8 to 8½	21½	11¼	90	4	18.00

*For 1 or 2 cylinder motors. For 3 and 4 cylinder motors use one size larger Silencer. For 6 and 8 cylinder motors use two sizes larger Silencer.

Silencers only come in sizes as listed; for smaller or larger exhausts, bushings will have to be used.

YANKEE SILENT MARINE MUFFLERS

Size Inches	For Engine H. P.	No. Cylinders	Plain Each	With Copper Hood
8	1 to 3	1	$3.00	$4.00
12	3 to 6	1 or 2	4.50	6.00
18	6 to 10	1, 2 or 3	5.50	7.00
24	6 to 10	4	6.00	8.00
24	10 to 20	2, 3 or 4	6.00	8.00
30	over 20	any number	6.50	9.00

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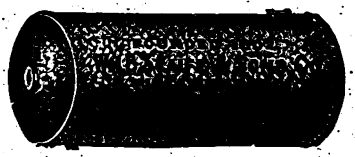
GASOLINE AND AIR TANKS

GASOLINE STORAGE TANKS

For Motor Boats

Riveted



Welded

Made from highest grade open hearth steel. Thoroughly galvanized inside and outside with pure zinc. The utmost care is exercised in their construction to insure absolute tightness.

Nominal Capacity Gallons	Dimensions Diam. Length Inches	Openings Inches	Riveted Each	Welded Each
5	9x20	¼ & 1	$....	$....
6	10x20	¼ & 1	....	....
8	12x20	¼ & 1¼	....	....
10	12x24	¼ & 1¼	....	....
12	12x32	¼ & 1¼	....	....
15	12x36	¼ & 1¼	....	....
20	14x30	¼ & 1¼	....	....
25	14x38	¼ & 1¼	....	....
25	16x30	¼ & 1¼	....	....
30	16x36	¼ & 1¼	....	....
30	18x30	⅜ & 1½	....	....
40	18x42	⅜ & 1½	....	....
50	20x40	⅜ & 1½	....	....
60	20x48	⅜ & 1½	....	....
75	20x56	⅜ & 1½	....	....
75	22x50	⅜ & 1½	....	....
100	22x60	⅜ & 1½	....	....

The length of these tanks is measured over all.

Rivetless tanks are ideal for gasoline storage. The welded seams have almost the full strength of the material; whereas the riveted seam is only 50 per cent as strong. The entire absence of rivet holes eliminates all possible danger of leakage.

AIR TANKS

Copper Brazed

Galvanized, for 100 lbs. working pressure.

Inches	Each
6x20	$....
7x20	....
8x20	....
9x20	....
10x20	....
10x33	....
12x20	....
12x33	....
12x42	....
14x30	....

Painted or galvanized for 200 and 300 lbs. working pressure.

Dimensions Inches	200 Lbs. Painted	200 Lbs. Galv.	300 Lbs. Painted	300 Lbs. Galv.
12x60	$....	....	....	....
14x60	....	....	....	....
16x48	....	....	....	....
16x60	....	....	....	....
18x60	....	....	....	....
18x72	....	....	....	....
18x96	....	....	....	....
20x96	....	....	....	....
22x96	....	....	....	....

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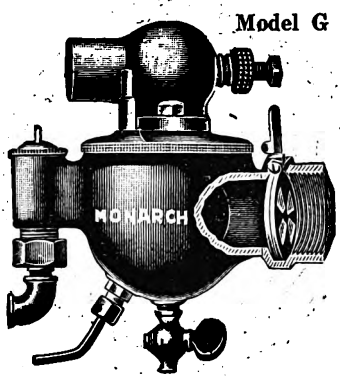
CARBURETORS AND GASOLINE STRAINERS

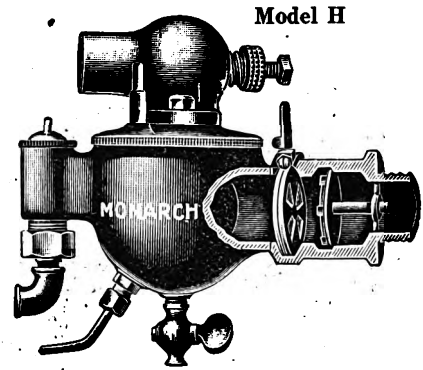
MONARCH CARBURETORS

Model G



	Net Price
¾ in.	$8.00
1 in.	8.50
1¼ in.	9.00
1½ in.	12.00
2 in.	18.00

Model H

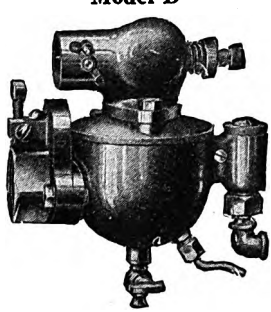


	Net Price
¾ in.	$9.00
1 in.	9.50
1¼ in.	10.00
1½ in.	13.50
2 in.	21.00

Model H is a combination of carburetor and check valve combined, and designed expressly for two-port engines. It is also equipped with our special shutter, which insures an easy start on a cold engine.

SCHEBLER CARBURETOR

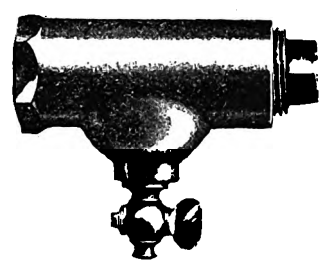
Model D



The 1 inch and 1¼ inch sizes are made with shutter air valve. The ¾ inch, 1½ inch and 2 inch sizes are made with flusher in the lid. The air intake and throttle are interchangeable and connections can be made to either vertical or horizontal manifolds.

Threaded for ¾ in. I. P.	$15.00
Threaded for 1 in. I. P.	16.00
Threaded for 1¼ in. I. P.	17.00
Threaded for 1½ in. I. P.	22.00
Threaded for 2 in I. P.	44.00

GASOLINE STRAINERS



The gauze strainer deflects all particles into the pocket below it and the drip cock when open instantly drains the pocket without the necessity of shutting off the gasoline and stopping the motor. The gauze strainer is removable for cleaning. Both connections are ¼ inch. Entire fitting is made of brass, neatly finished.

Width 1¼ in. Depth 2¾ in.

Price $1.50

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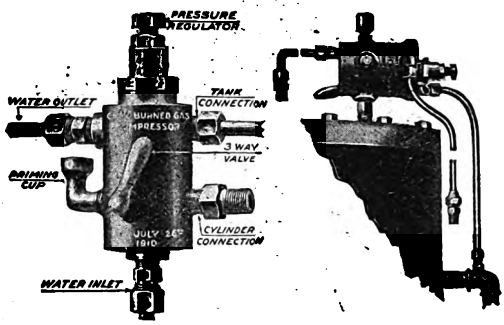
COMPRESSORS AND PRESSURE GAUGES

BURNT GAS COMPRESSOR

Model O Model I

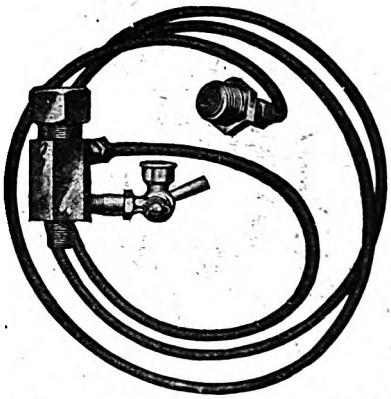


A high grade compressor for attaching to the cylinder head of the engine; using the burned gas for compressing the air in the tank to blow the whistle. The compressor is provided with a three-way valve which permits priming directly through the compressor, or stopping it at will.

Models	Finish	Each
0-A	For top of cylinder, polished....	$6.50
0C	For side of cylinder, polished....	6.50
1A	For top of cylinder, polished....	7.50
1C	For side of cylinder, polished....	7.50
3A	For top or side of cylinder.....	5.00

Model O—1½x4 in. Model I—2½x4½ in.

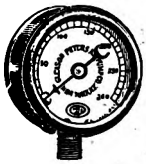
ACCUMULATOR



This Accumulator is used on top of the cylinder in place of the relief valve or priming cup for utilizing the explosive charge in the tank for blowing the whistle. It meets the requirements of the government regulations.

Accumulator complete with priming cup, 2 couplings with 1 check valve; 1 flame arrester; 10 feet of ¼ in. copper tube	$ 4.50
1 steel tank 8x20, 1000 cu. in.....	3.75
1 1½ in. single tone whistle and whistle valve	3.00
Price complete	$11.25

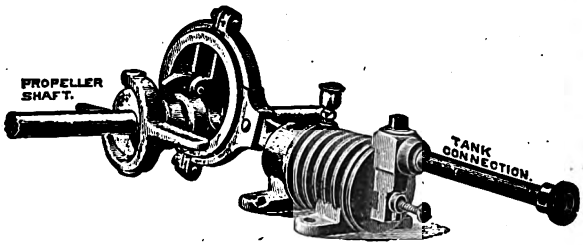
AIR PRESSURE GAUGE



This is an accurate, well made 2½ in. gauge for boat use. When ordering, say whether 100, 150 or 200 pound gauge is desired.

No. 17.....each, $3.00

U-W AIR COMPRESSOR



Can be fitted to any size shaft up to and including 1½ in. diameter. With shaft running 500 revolutions per minute and a 12x24 in. air tank, 100 lbs. air pressure can be had in 11 minutes. Fully guaranteed. Write for further particulars.

Price .....each, $12.50

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SHAFTING, COUPLINGS AND BEARINGS

STEEL AND BRONZE SHAFTING

Diam. inches	½	⅝	¾	⅞	1	1⅛	1¼	1⅜	1½	1⅝
Steel per lb.	$0.07	.06	.05½	.05½	.05½	.05½	.05½	.05½	.05	.05
Bronze per lb.	...	...	...	..	...	...	...	...	...	...
Diam. inches	1¾	1⅞	2	2⅛	2¼	2⅜	2½	2⅝	2¾	3
Steel per lb.	$0.05	.05	.05	.05	.50	.05	.05	.05	.05	.05
Bronze per lb.	...	...	...	..	...	...	...	...	...	...

SHAFT COUPLINGS

Flange Coupling

⅝ to 1 in.	$2.00
1⅛ to 1⅜ in.	2.50
1½ to 1¾ in.	3.00

Keyseating with key, $1.00 extra.

Round Coupling

Four Set Screws and Key

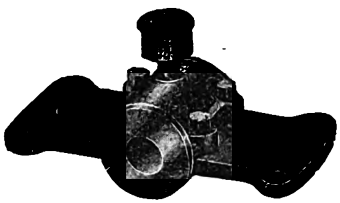
⅝ to ⅞ in.	$3.50
1 to 1 3/16 in.	4.50
1¼ to 1½ in.	5.50
1⅝ to 2 in.	6.50

Clamp Coupling

Four Bolts

Size, in...	⅝	¾	1	1¼	1½	1¾	2
Prices ..	$2.00	2.50	3.00	3.60	4.00	4.50	5.00

SHAFT BEARINGS

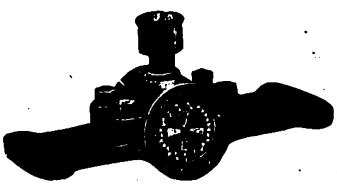


A—Intermediate bearing, cast iron, journal babbitted, one grease cup.

Size, in...	⅝	¾	1	1¼	1½	1¾	2
Prices ..	$2.50	2.75	3.00	3.50	4.00	4.50	5.00

B—Intermediate thrust bearing with two collars, cast iron, journal babbitted, one grease cup.

Size, in...	⅝	¾	1	1¼	1½	1¾	2
Prices ..	$3.25	3.50	3.75	4.25	4.75	5.25	5.75



C—Intermediate roller thrust bearing, cast iron, steel rollers, two collars, one grease cup.

Size, in...	⅝	¾	1	1¼	1½	1¾	2
Prices ..	$4.50	4.75	5.00	5.50	6.00	6.50	7.00

D—Intermediate roller and ball thrust bearing cast iron, steel rollers, one ball race, two collars, one grease cup.

Size in...	⅝	¾	1	1¼	1½	1¾	2
Prices .	$5.50	6.00	6.40	7.15	7.75	8.75	10.00

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UNIVERSAL JOINTS

A universal joint should be used on every reverse gear connecting propeller shaft to reverse gear, but never between engine and reverse gear. It facilitates perfect alignment and obviates imperfect alignment of propeller shaft to gear, besides it lessens the undue strain caused by vibration and twisting of the hull. A thrust bearing *must* be used aft of universal joints to take the thrust of propeller wheel.

Single

No.	Engine End Couplings Bored out to	Propeller End Couplings Bored out to	Length Over All	Swings in Circle Diam.	Price Bored Complete
1	⅝ to 1⅛	⅝ to ¾	5½	3¾	$8.40
2	1 to 1¼	¾ to 1	6	4½	9.00
3	1⅛ to 1½	1 to 1¼	8	5	12.00
4	1¼ to 1¾	1¼ to 1½	9½	6	15.00
5	1¾ to 2	1½ to 2	11	6	18.00
6	2 to 2½	1¾ to 2	11½	6	21.00

Double

No.	Engine End Couplings Bored out to	Propeller End Couplings Bored out to	Length Over All	Swings in Circle Diam.	Price Complete Bored
12	1 to 1¼	¾ to 1	8¾	4½	$18.00
13	1⅛ to 1½	1 to 1¼	11	5	21.00
14	1¼ to 1¾	1¼ to 1½	13	6	24.00
15	1¾ to 2	1½ to 2	14½	6	26.00
16	2 to 2½	1¾ to 2	15	6	28.00

When ordering, specify size of shaft at both ends, whether round, taper or square, and size of key.

Bronze, Especially Designed for Motor Boats and Heavy Duty Machines

These joints are so designed as to give a long bearing on all the studs. The yokes and centers are made of hard bronze, and the studs of special steel. Each stud is securely fastened into the center, bringing the strain on the strongest part of the joint. All bearings are provided with oiling device. These joints are designed for an angle of 25 degrees or less.

These joints are all bored to sizes specified in the following list and when properly mounted will transmit horsepower equal to the size shaft for which they are bored.

Hub Diam. Inches	Length Inches	Bore Inches	Weight Lbs. Per Joint	Each
1¼	4	¾	1½	$3.75
1½	4¾	⅞	2½	4.00
1¾	5½	1	4½	5.00
2	6¾	1¼	7	8.00
2½	8¾	1½	15	12.50

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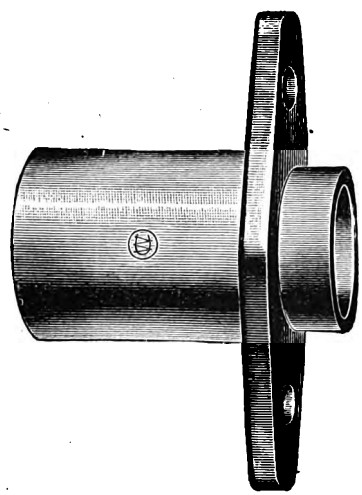
BEARINGS AND STUFFING BOXES

BALL THRUST COLLAR BEARINGS

It consists of a brass cage in which balls are so inserted that no two run in the same track. With the ball cage, and included in the prices, are two hardened and ground steel washers.

Shaft Diam. Inches	Outside Diam. Inches	Width Over All Inches	Wgt. of Bearing Oz.	Each
1/2	1 7/32	9/16	2 1/4	$0.80
9/16	1 7/32	9/16	2 1/4	.80
5/8	1 11/32	9/16	2 1/4	.80
11/16	1 11/32	9/16	2 1/4	.80
3/4	1 15/32	9/16	2 3/4	.90
13/16	1 15/16	9/16	2 3/4	.90
7/8	1 27/32	5/8	5 1/2	.90
15/16	1 27/32	5/8	5 1/4	.90
1	1 31/32	5/8	6	.90
1 1/16	1 31/32	5/8	5 1/2	.90
1 1/8	2 3/32	5/8	6	1.00
1 3/16	2 3/32	5/8	8	$1.00
1 1/4	2 11/32	5/8	8	1.00
1 5/16	2 11/32	5/8	8	1.00
1 3/8	2 15/32	5/8	8 1/2	1.30
1 1/2	2 19/32	5/8	8 3/4	1.30
1 5/8	2 31/32	13/16	15 3/4	1.75
1 3/4	3 3/32	13/16	17 1/2	1.75
1 7/8	3 7/32	13/16	16	2.25
2	3 11/32	13/16	19 1/2	2.25
2 1/8	3 19/32	13/16	22 1/2	2.50
2 1/4	3 23/32	13/16	23 1/2	2.50

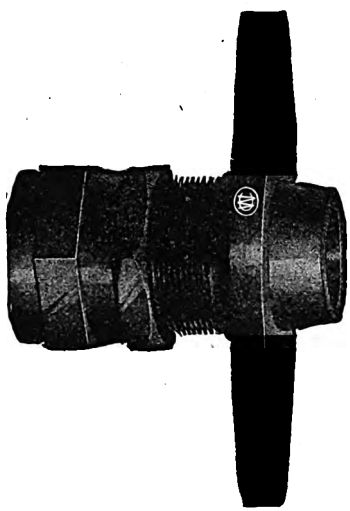
BRONZE STERN BEARINGS



Bored for Shaft, In.	Each
1/2	$1.00
5/8	1.10
3/4	1.15
7/8	1.30
1	1.50
1 1/8	2.00
1 1/4	2.20
1 3/8	2.50
1 1/2	3.00
1 5/8	4.00
1 3/4	5.00
2	6.00

BRONZE STUFFING BOXES

Standard Pattern



Bored for Shaft, In.	Each
1/2	$1.00
5/8	1.20
3/4	1.50
7/8	1.75
1	2.00
1 1/8	2.40
1 1/4	2.80
1 3/8	3.75
1 1/2	4.50
1 5/8	5.50
1 3/4	7.00
2	8.00

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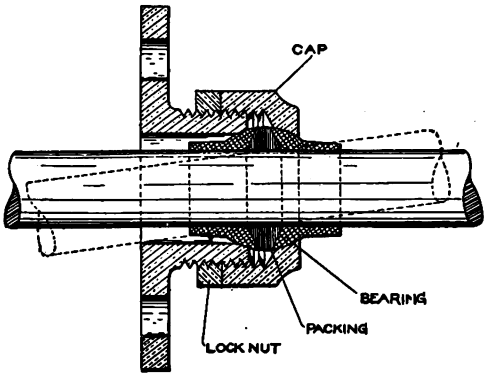
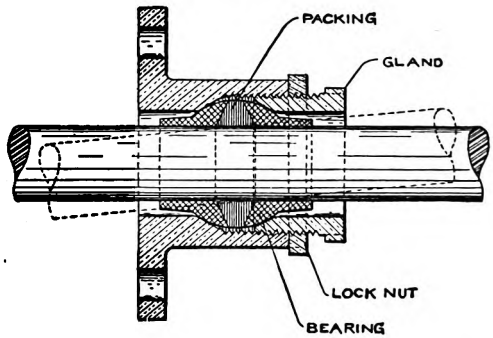
STUFFING BOXES AND STRUTS

THE NO-BIND PATENTED STUFFING BOX

Type A, ½ to 1 in.



Type B, 1⅛ to 2½ in.

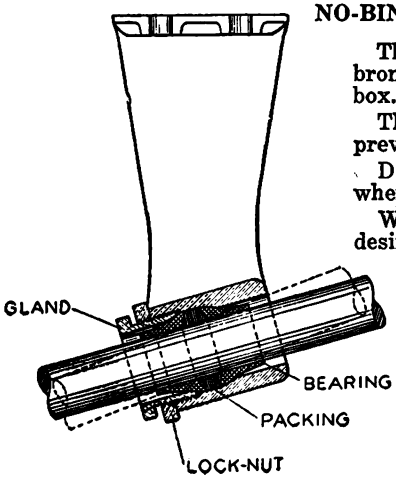


Points Worth Considering

Easy starting of motor. Universal wearing eliminates leakage. Packed with self-lubricating packing. All friction eliminated—does not wear or grind the shaft. It increases the power of the motor, making it easy to start. The motor is installed much cheaper, as the excessive labor cost for accurate lining is saved. Being self-aligning, it is always in line and cannot bind, which allows the motor to develop its full power. The No-Bind contains a universal bearing that can be replaced if worn without renewing or removing the stuffing box.

Bored for Shaft Diam. Inches	Base Dimensions Inches	Bronze Bearing Each	Box Bab. Bearing Each
½	3⅝x1¾	$1.60	$2.10
⅝	3¾x2	1.60	2.30
¾	4⅛x2¼	1.75	2.60
⅞	4½x2⅜	2.00	2.90
1	5 x2⅝	2.35	3.45
1⅛	5¼x2⅝	3.40	4.47
1¼	5½x3	3.65	4.76
1⅜	5¾x3	4.00	4.90
1½	6½x3⅛	4.75	6.55
1⅝	6½x3¼	6.20	7.70
1¾	6¾x3¾	7.75	9.30
1⅞	7 x3⅞	9.25	11.15
2	7½x3⅞	11.00	12.80
2¼	7¾x4⅛	13.00	15.15
2½	8 x4⅜	15.00	16.70

NO-BIND PATENT STRUT



The No-Bind Patented Strut is made of manganese bronze, contains all the features of the No-Bind stuffing box.

The bearing will align itself to any shaft angle and prevent waste of power.

Die-cast anti-friction bushings may be easily replaced when worn.

When ordering, specify diameter of shaft and drop desired.

Length of Drop	Diameter of Shaft ¾ in.	⅞ in.	1 in.	1⅛ in.	1¼ in.	1⅜ in.
7 in.	$6.75	7.00	....	....	....	....
8 in.	7.65	7.90	8.55	8.80	....	....
9 in.	8.10	8.35	9.00	9.25	10.15	10.35
10 in.	8.55	8.80	9.45	9.70	10.80	11.05
11 in.	....	....	9.90	10.15	11.70	11.95
12 in.	....	....	....	....	12.60	12.85
13 in.	....	....	....	....	13.50	13.75

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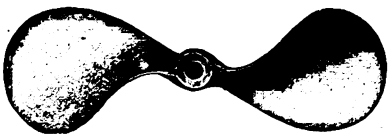
BRONZE PROPELLER WHEELS

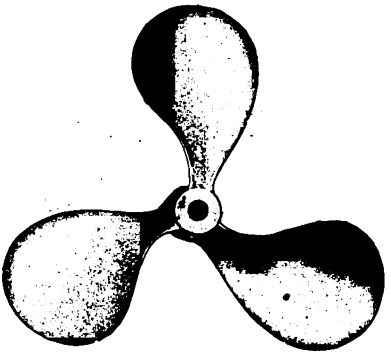
STANDARD TWO BLADES



Diam. Wheel Inches	Price Each	Diam. Wheel Inches	Price Each
10	$3.75	20	$14.00
12	4.25	22	17.00
13	5.00	24	19.00
14	6.25	26	28.00
15	7.00	28	34.00
16	7.65	30	38.00
18	10.00	32	42.00

Stock sizes represent: Pitch equal to diameter; pitch equal to 25% more than diameter; pitch equal to 50% more than diameter.

STANDARD THREE BLADE



Diam. Wheel Inches	Price Each	Diam. Wheel Inches	Price Each
10	$6.50	20	$21.00
12	7.00	22	24.00
13	7.50	24	28.00
14	8.00	26	34.00
15	10.00	28	40.00
16	12.00	30	52.00
18	16.00	36	80.00

BRYANT AND BERRY

Two Blades

Diam. Wheel Inches	Price Polished Not Bored	Extra for Boring and Key Seating
10½	$1.80	$0.75
12	2.28	.75
13	2.70	1.00
14	2.88	1.00
15	3.15	1.00
16	3.90	1.25
17	4.50	1.25
18	4.95	1.50
19	5.75	1.50
20	6.25	1.50
21	7.25	1.75
22	8.10	1.75
24	9.60	2.00
26	12.00	2.00

BRYANT AND BERRY

Three Blades

Diam. Wheel Inches	Price Polished Not Bored	Extra for Boring and Key Seating
10½	$2.10	$1.00
12	2.75	1.00
13	3.75	1.00
14	4.20	1.25
15	5.00	1.25
16	5.70	1.50
17	6.25	1.50
18	6.50	1.50
19	7.50	1.50
20	8.75	1.50
21	9.90	2.00
22	10.80	2.00
24	13.80	2.25
26	16.80	2.50
28	20.40	2.75
30	25.00	3.00

HOW TO ORDER WHEELS

In ordering, please state if you want a left or right hand wheel.

How to Tell a Right from a Left Hand Wheel—In facing the flywheel looking aft, if top of flywheel turns from right to left, it requires a right hand wheel. If top of flywheel turns from left to right, a left hand wheel.

In standing aft of stern of boat, facing the bow, a right hand wheel enters the water turning to the right, same as a right hand screw. A left hand wheel enters the water turning to the left, same as a left hand screw, both taking the water on the back side of the blades or flat side. The crowning side of wheel should be next to boat, the flat side or working surface aft.

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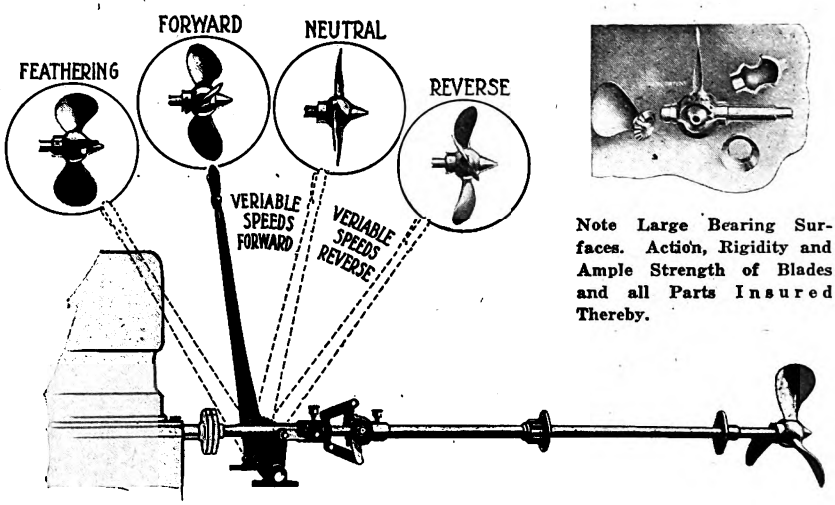
GORDON REVERSIBLE PROPELLERS



Note Large Bearing Surfaces. Action, Rigidity and Ample Strength of Blades and all Parts Insured Thereby.

Reversible, Interchangeable, Feathering Blades

Every part is as carefully finished as modern machinery can make it. Special jigs and tools insure every piece being exact size.

The parts are machined to .001 part of an inch. This fact makes the Gordon blades as rigid and as strong as a solid wheel. They stay at any pitch you choose to set them. They cannot vary. The hub is sand proof.

There is no fore and aft movement of the sleeve as in other makes. The Gordon idea stops wear and prevents leakage.

Reversible wheels having the sliding movement can have but three pitches—full ahead, neutral and full reverse. With the Gordon you can also secure any intermediate pitch instantly.

It answers quickly when reversing—from full ahead to full reverse at a touch of the lever, without racing or affecting the engine. It will stop a boat running at full speed quicker than any other outfit on the market.

The blades can be instantly feathered by simply throwing the lever clear over. Eliminates any drag and makes an ideal wheel for auxiliaries.

The quick response to a touch of the lever on a Gordon makes for perfect and easy control.

Perfect control means perfect landings. It means a saving in fuel consumption. It means less wear and tear on your engine. It eliminates danger of stalling your engine.

The Gordon invariably increases the speed of any boat on which it is used.

All blades of the Gordon are made of the finest manganese bronze. In salt water outfits all other parts are of phosphorus bronze. Fresh water equipment includes steel shaft, lever and quadrant and straps, with balance of outfit as in the salt water equipment.

If you are interested in a propeller that will mean satisfaction, safety, and money saved to you, let us tell you more about the Gordon.

The Gordon is also made with weedless blades.

It is the only reversible weedless propeller on the market that is weedless both ways.

Prices and data on following pages. Complete catalogue on request.

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GORDON REVERSIBLE PROPELLERS

List of Sizes and Prices

Hub No.	Diam. of Propeller Inches	No. Blades	Diam. Shaft Inches	Diam. Sleeve Inches	Length Shaft Feet	Length Sleeve Feet	Steel Shaft	Bronze Shaft	Extra Brass Lever and Quadrant	Extra Bow Control
1	10	2	¾	1 1/16	5	3	$41.50	43.00	2.00	1.00
1	10	3	¾	1 1/16	5	3	43.00	44.50	2.00	1.00
1	12	2	¾	1 1/16	5	3	43.00	45.00	2.00	1.00
1	12	3	¾	1 1/16	5	3	43.50	45.50	2.00	1.00
1	13	2	¾	1 1/16	5	3	44.00	45.50	2.00	1.00
1	13	3	¾	1 1/16	5	3	45.75	47.25	2.00	1.00
2	14	2	1	1 5/16	6	4	51.85	55.35	3.00	1.25
2	14	3	1	1 5/16	6	4	53.75	57.25	3.00	1.25
2	16	2	1	1 5/16	6	4	53.75	58.25	3.00	1.25
2	16	3	1	1 5/16	6	4	55.80	59.50	3.00	1.25
2	17	2	1	1 5/16	6	4	55.80	59.50	3.00	1.25
2	17	3	1	1 5/16	6	4	58.10	61.80	3.00	1.25
3	18	2	1⅛	1 7/16	6	4	71.94	76.34	4.40	1.65
3	18	3	1⅛	1 7/16	6	4	72.60	79.20	4.40	1.65
3	20	2	1⅛	1 7/16	6	4	72.60	79.20	4.40	1.65
3	20	3	1⅛	1 7/16	6	4	75.35	79.75	4.40	1.65
3	21	2	1⅛	1 7/16	6	4	75.35	79.75	4.40	1.65
3	21	3	1⅛	1 7/16	6	4	75.90	80.30	4.40	1.65
3	22	2	1⅛	1 7/16	6	4	75.90	80.30	4.40	1.65
3	22	3	1⅛	1 7/16	6	4	76.45	80.85	4.40	1.65
4	20	2	1¼	1 21/32	7	5	87.75	94.65	5.75	2.01
4	20	3	1¼	1 21/32	7	5	91.43	98.33	5.75	2.01
4	22	2	1¼	1 21/32	7	5	91.43	98.33	5.75	2.01
4	22	3	1¼	1 21/32	7	5	92.12	99.48	5.75	2.01
4	23	2	1¼	1 21/32	7	5	92.12	99.48	5.75	2.01
4	23	3	1¼	1 21/32	7	5	96.14	103.50	5.75	2.01
4	24	2	1¼	1 21/32	7	5	96.14	103.50	5.75	2.01
4	24	3	1¼	1 21/32	7	5	100.34	107.70	5.75	2.01
4	26	2	1¼	1 21/32	7	5	100.34	107.70	5.75	2.01
4	26	3	1¼	1 21/32	7	5	105.05	112.42	5.75	2.01
5	26	2	1½	1 29/32	8	6	122.20	130.20	6.50	2.00
5	26	3	1½	1 29/32	8	6	126.50	134.50	6.50	2.00
5	28	2	1½	1 29/32	8	6	126.50	134.50	6.50	2.00
5	28	3	1½	1 29/32	8	6	153.78	163.38	7.80	2.40
5	30	2	1½	1 29/32	8	6	153.78	163.38	7.80	2.40
5	30	3	1½	1 29/32	8	6	155.94	165.54	7.80	2.40
5	32	2	1½	1 29/32	8	6	155.94	165.54	7.80	2.40
5	32	3	1½	1 29/32	8	6	158.28	167.88	7.80	2.40
5	34	2	1½	1 29/32	8	6	158.28	167.88	7.80	2.40
5	34	3	1½	1 29/32	8	6	160.80	170.40	7.80	2.40
6	34	2	2	2⅜	9	7	225.60	242.10	10.20	3.00
6	34	3	2	2⅜	9	7	234.60	254.10	10.20	3.00
6	36	2	2	2⅜	9	7	234.60	254.10	10.20	3.00
6	36	3	2	2⅜	9	7	239.10	258.60	10.20	3.00
6	38	2	2	2⅜	9	7	239.10	258.60	10.20	3.00
6	38	3	2	2⅜	9	7	243.60	263.10	10.20	3.00
6	40	2	2	2⅜	9	7	243.60	263.10	10.20	3.00
6	40	3	2	2⅜	9	7	248.10	267.60	10.20	3.00
6	42	2	2	2⅜	9	7	248.10	267.60	10.20	3.00
6	42	3	2	2⅜	9	7	252.60	272.10	10.20	3.00

Prices on larger sizes quoted on application.

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GORDON REVERSIBLE PROPELLERS

Approximate Diameter and Pitch of Gordon Propellers for Speed Boats and Light Craft with Good Power for Boat

This table is for Gordon propellers and does not apply to other makes of propellers.

	Revolutions Per Minute									
H. P.	200	225	275	350	450	575	725	900	1100	1325
2	20x 30	18x 27	16x 24	14x 21	12x 18	10x 15	.....	.....	.....	.....
3½	22x 33	20x 30	18x 27	16x 24	14x 21	12x 18	10x15	.....	.....	.....
5	24x 36	22x 33	20x 30	18x 27	16x 24	14x 21	12x18	10x15	.....	.....
8	26x 39	24x 36	22x 33	20x 30	18x 27	16x 24	14x21	12x18	10x15	.....
11	28x 42	26x 39	24x 36	22x 33	20x 30	18x 27	16x24	14x21	12x18	10x15
15	30x 45	28x 42	26x 39	24x 36	22x 33	20x 30	18x27	16x24	14x21	12x18
20	32x 48	30x 45	28x 42	26x 39	24x 36	22x 33	20x30	18x27	16x24	14x21
26	34x 51	32x 48	30x 45	28x 42	26x 39	24x 36	22x33	20x30	18x27	16x24
33	36x 54	34x 51	32x 48	30x 45	28x 42	26x 39	24x36	22x33	20x30	18x27
41	38x 57	36x 54	34x 51	32x 48	30x 45	28x 42	26x39	24x36	22x33	20x30
50	40x 60	38x 57	36x 54	34x 51	32x 48	30x 45	28x42	26x39	24x36	22x33
61½	42x 63	40x 60	38x 57	36x 54	34x 51	32x 48	30x45	28x42	26x39	24x36
74	44x 66	42x 63	40x 60	38x 57	36x 54	34x 51	32x48	30x45	28x42	26x39
87½	46x 69	44x 66	42x 63	40x 60	38x 57	36x 54	34x51	32x48	30x45	28x42
103	48x 72	46x 69	44x 66	42x 63	40x 60	38x 57	36x54	34x51	32x48	30x45
120	50x 75	48x 72	46x 69	44x 66	42x 63	40x 60	38x57	36x54	34x51	32x48
139	52x 78	50x 75	48x 72	46x 69	44x 66	42x 63	40x60	38x57	36x54	34x51
161	54x 81	52x 78	50x 75	48x 72	46x 69	44x 66	42x63	40x60	38x57	36x54
183	56x 84	54x 81	52x 78	50x 75	48x 72	46x 69	44x66	42x63	40x60	38x57
207	58x 87	56x 84	54x 81	52x 78	50x 75	48x 72	46x69	44x66	42x63	40x60
234	60x 90	58x 87	56x 84	54x 81	52x 78	50x 75	48x72	46x69	44x66	42x63
264	62x 93	60x 90	58x 87	56x 84	54x 81	52x 78	50x75	48x72	46x69	44x66
295	64x 96	62x 93	60x 90	58x 87	56x 84	54x 81	52x78	50x75	48x72	46x69
329	66x 99	64x 96	62x 93	60x 90	58x 87	56x 84	54x81	52x78	50x75	48x72
366	68x102	66x 99	64x 96	62x 93	60x 90	58x 87	56x84	54x81	52x78	50x75
405	70x105	68x102	66x 99	64x 96	62x 93	60x 90	58x87	56x84	54x81	52x78
447	72x108	70x105	68x102	66x 99	64x 96	62x 93	60x90	58x87	56x84	54x81
491	74x111	72x108	70x105	68x102	66x 99	64x 96	62x93	60x90	58x87	56x84
539	76x114	74x111	72x108	70x105	68x102	66x 99	64x96	62x93	60x90	58x87
590	78x117	76x114	74x111	72x108	70x105	68x102	66x99	64x96	62x93	60x90

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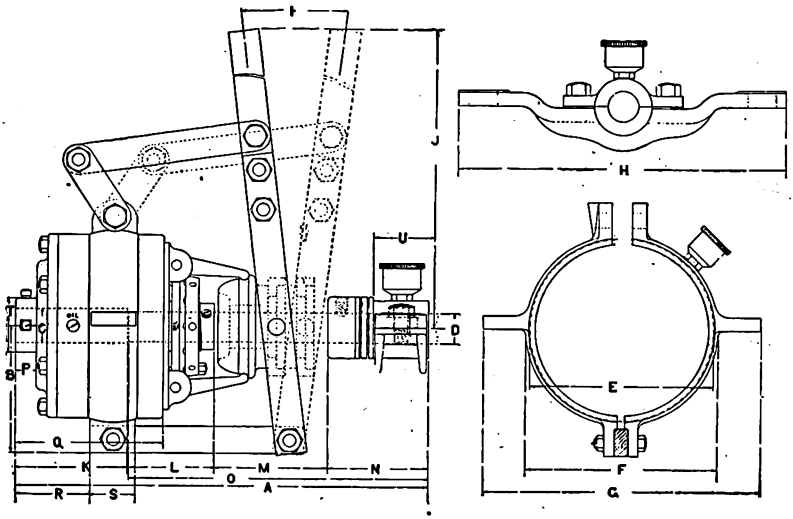
REVERSE GEARS

PARAGON

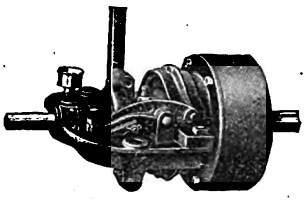


Size	Weight Pounds	H. P.	Approx. H. P. Per 100 R. P. M.	Price	Rear Bearing Ball Thrust Thrust Collar Extra
O	33	1 to 5	1	$25.00	$3.00
A	56	4 to 16	1¼	32.00	3.00
A Special	60	5 to 20	2	40.00	3.00
B	100	6 to 24	3½	46.00	4.00
B Special	104	8 to 32	4½	56.00	4.00
C	175	10 to 40	5½	65.00	5.00
C Special	180	12 to 50	7	80.00	5.00
D	300	15 to 60	8	92.00	8.00
D Special	305	20 to 80	9	112.00	8.00
E	350	25 to 100	15	138.00	12.00

GIES

Complete Gear

Open Gear
Models 1, A, B

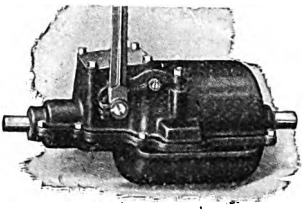


Style of Gear	For Engines up to	Size in Inches	Price Each
Spec. No. 1	2 cyl.	4½x4½	$25.00
Model A	4 cyl.	4¼x4¼	35.00
Model B	4 cyl.	4¾x4¾	55.00
Model E	2 cyl.	4½x4½	35.00
Model F	4 cyl.	4¼x4¼	45.00

Ball Thrust Bearings

For Model 1.....$1.50
For Model A..... 1.75
For Model B..... 2.00

Closed Gear
Model E, F



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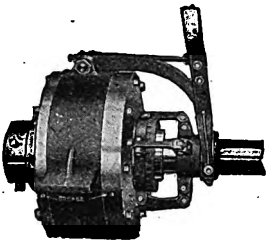
REVERSE GEARS, CLUTCHES AND STARTERS

JOE'S REVERSE GEARS



In ordering, mention the diameter of engine and propeller shafts and keyways, bore, stroke, speed, number of cylinders and cycle of motor, and if convenient, the size and pitch of propeller. Mention rear and thrust bearings if desired.

High Power

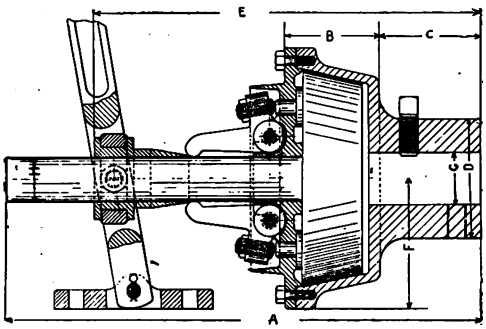
Size No.	Weight	H. P. Per 100 Rev.	Motors 1000 R. P. M.	For Motors 400 R. P. M.	Without Bearings	Rear and Thrust Bearings
17	18	½	H.P. to 5	H.P. to ½	$30.00	$5.00
19	19	¾	5-10	2- 5	35.00	5.00
27	42	2	10-20	5-10	42.50	6.25
26	43	2½	12-25	6-12	47.50	6.25
37	90	3½	16-30	7-16	80.00	8.12

Duplex Drive

120	62	2½	.....	6- 10	$66.00	$7.80
130	85	5	.....	8- 20	75.00	7.80
135	105	7	.....	10- 28	86.00	9.00
140	170	9	.....	12- 35	115.00	9.00
150	260	12	.....	14- 45	154.00	15.00
160	345	15	.....	15- 60	203.50	Special
170	825	25	.....	25-100	467.50	Special

JOE'S ONE-WAY CLUTCHES

A Great Convenience for Little Money Where Reverse Motion Is Not Required



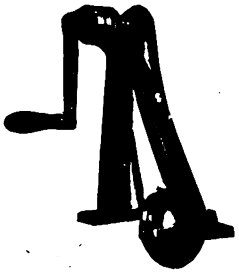
Dimensions

Size No.	Price	Wt.	H.P. per 100 Rev.	A	B	C	D	E	F	G	H
12	$18.00	24	2	16¾	2¾	3	3	11½	3	1¾	1⅛
13	28.80	40	3½	17¾	3	3	3	12¼	3½	2	1¼
14	38.40	60	5	19½	3¼	3¾	3½	14¼	4¼	2¼	1½

NOTE—Size G as above can be made smaller.

In ordering mention shaft sizes and keyways at both ends. Over all length can be made shorter if required.

These clutches are regularly furnished bored on engine end to fit engine shaft and with stub shaft on propeller end, but can be furnished bored on propeller end, when space is limited, at additional prices: No. 12, $1.50. No. 13, $1.75 and No. 14 $2.00. When bored for propeller the propeller shaft is keyed and screwed to the friction cone inside of clutch.



Safety Rear Starter with Adjustable Frame

JOE'S REAR STARTER

Made in Two Sizes

	No. 20	No. 40
Fast motors, h.p.	8 to 20	20 to 40
Slow motors, h.p.	4 to 8	8 to 15
Height to center	14 to 20″	14 to 20″
Width between bed screws	8 to 18″	8 to 18″
Price, plain	$25.00	$40.00
Price, with safety	40.00	56.25

This starter is reversible and can be used on engines running in either direction, but the safety device is made right or left hand as specified. All frames are adjustable both for height and width of base.

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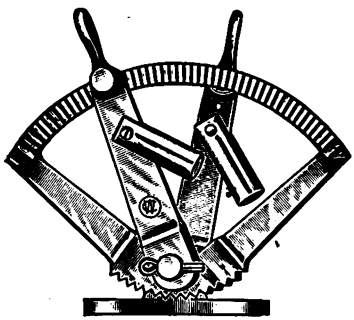
CONTROLS AND BALL JOINTS

SPARK AND THROTTLE CONTROLS

Polished Brass

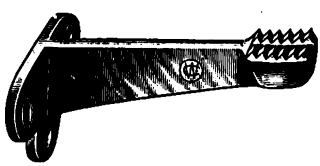
Vertical Type



The control is adjustable on its base plate. This feature is important as it allows the control to be attached to surfaces which are not exactly parallel to the direction in which the rods are to lead. The adjustment is controlled by one machine screw.

Single, with clips for ¼ in. rod..each, $3.25
Double, with clips for ¼ in. rod.each, 3.50

FRONT BRACKET FOR USE WITH VERTICAL CONTROL

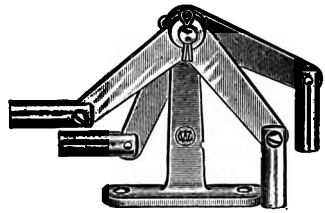


This bracket is interchangeable with the plate shown in above cut of control. By having the extra bracket in stock, dealers can supply either vertical or horizontal controls, as their customers desire.

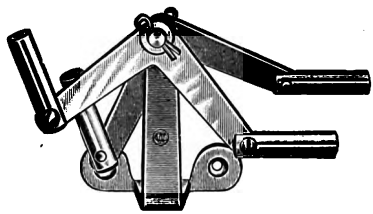
Single control with front bracket.....$3.50
Double control with front bracket..... 3.75
Front bracket only ..... .75

CONTROL CRANKS

Upright



Side



These cranks are for use in connection with the spark and throttle controls. The rod clips are tapped for ¼ in. rod with No. 20 U. S. S. thread.

	Plain Brass Each	Finished Brass Each
Single cranks with bracket..	$1.00	$1.65
Double cranks with bracket..	1.65	2.25
Cranks only	.15	.35
Brackets only	.30	.70
Rod clips	.	.25

CONTROL RODS

¼ inch brass rod threaded to fit above sockets or plain ends, any length to order. Price on application.

BALL JOINTS

No.	Threaded End	Tapped End
1.....	5/16—18	10—32
2.....	5/16—18	¼—20
3.....	¼—27	¼—24
4.....	¼—27	¼—27
5.....	¼—28	¼—28
6.....	⅜—16	¼—20
7.....	¼—20	¼—20
8.....	3/16—32	3/16—32
9.....	7/32—32	7/32—32
12.....	10—32	6—32

Nos. 1 to 12.....each, $0.20

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GAUGE GLASSES

BISHOP'S ADAMANT GAUGE GLASSES

Tests Given Adamant Gauge Glasses

Dipping Test

Heated in valve oil at 350 degrees F., for one minute, and as quickly as possible removed from this and dropped into water 40 degrees F., this test repeated fifteen times without the tube breaking.

Digester Test

Subjected to a steam pressure of not less than 75 or more than 100 lbs., for 72 hours. If at the expiration of this time the glass becomes cloudy, cracks or gives any indication of dissolving, it will be cause for rejection of the lot.

Pressure Test

Placed in a suitable holder and subjected to hydraulic pressure of one thousand pounds per square inch for one minute. If the tube bursts while under this pressure, it will be sufficient cause for rejection of the lot.

Under actual test of Adamant glasses, out of thirty-six tested, all passed.

Price, Per Dozen

Length Inches	Diameter, Inches ½ & ⅝	¾	⅞	1	Length Inches	Diameter, Inches ½ & ⅝	¾	⅞	1
10	$3.00	$3.60	$5.04	$6.12	20	$6.00	$7.44	$10.20	$12.12
11	3.24	3.96	5.64	6.72	21	6.30	7.80	10.68	12.75
12	3.60	4.32	6.12	7.32	22	6.60	8.16	11.16	13.44
13	3.84	4.80	6.60	7.92	23	6.90	8.60	11.63	14.05
14	4.20	5.16	7.08	8.52	24	7.20	8.88	12.12	14.64
15	4.44	5.52	7.56	9.12	30	9.00	11.16	15.24	18.24
16	4.80	5.88	8.16	9.72	36	10.80	13.44	18.24	21.96
17	5.04	6.24	8.64	10.32	48	14.52	18.00	24.36	29.16
18	5.40	6.60	9.12	10.92	60	18.12	22.56	30.48	36.48
19	5.64	7.08	9.60	11.52	72	21.84	27.12	36.48	43.80

Fractions of an inch charged as one inch

MONCRIEF SCOTCH GAUGE GLASSES

Price, Per Dozen

Length Inches	Diameter, Inches ½ & ⅝	¾	⅞	1	Length Inches	Diameter, Inches ½ & ⅝	¾	⅞	1
10	$3.00	$3.60	$5.04	$6.12	19	$5.64	$7.08	$9.60	$11.52
11	3.24	3.96	5.64	6.72	20	6.00	7.44	10.20	12.12
12	3.60	4.32	6.12	7.32	22	6.60	8.16	11.16	13.44
13	3.84	4.80	6.60	7.92	24	7.20	8.88	12.12	14.64
14	4.20	5.16	7.08	8.52	30	9.00	11.16	15.24	18.24
15	4.44	5.52	7.56	9.12	36	10.80	13.44	18.24	21.96
16	4.80	5.88	8.16	9.72	48	14.52	18.00	24.36	29.16
17	5.04	6.24	8.64	10.32	60	18.12	22.56	30.48	36.48
18	5.40	6.60	9.12	10.92	72	21.84	27.12	36.48	43.80

60x1¼ in., per dozen, $60.00

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BOILER FITTINGS AND FLUE CLEANERS

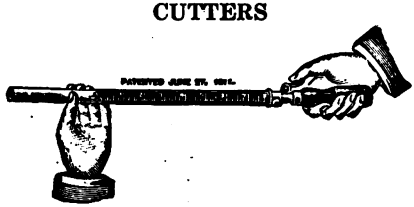
WATER GAUGES

Michigan

Round body, iron wheel, two guards; for ⅝x12 in. glass; shank ½ inch.

Without glass.....each, $4.25

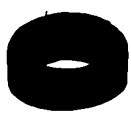
WILKINS' IMPROVED GAUGE GLASS CUTTERS



Cuts any length from ¼ to 8 in. Beam is graduated in eighths of an inch.

With one extra cutter.....each, $2.00

GAUGE GLASS WASHERS



Size, in.	½	⅝	¾	1
Common ...per doz., $....	....	....	....	....
Rainbow ...per doz.,	....	....	....	....

GILBERT GAUGE GLASS PRESERVERS

Size, in.	½	⅝	¾	1
Per box .....$....	....	....	....	....

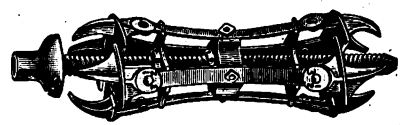
½, ⅝ and ¾ in., one dozen in a box; 1 in., eight in a box.

FLUE CLEANERS

Ruggles' Perfection

For tubes, in.....1¼ to 6
Per inch diameter.....$1.00
Sizes smaller than 2 in., same price as 2 inch.

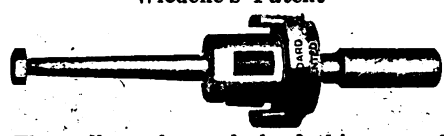
ENGINEERS' FAVORITE FLUE SCRAPERS



For tubes, in.....1¾ to 6
Per in. in diameter.....$1.00
Sizes smaller than 2 in., same price as 2 in.

BOILER TUBE EXPANDERS

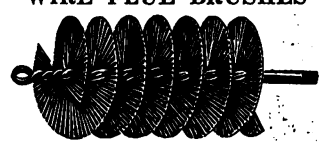
Wiedeke's Patent



The rolls and mandrel of this expander are made of tool steel and tempered. The frame is one piece, always furnishing a good bearing to the guard.

Diam., in. ...	1	1¼	1½	1¾	1⅞
Each	$10.00	10.00	10.00	10.00	10.00
Diam., in. ...	2	2⅛	2¼	2½	2¾
Each	$10.00	12.00	12.00	14.00	16.00
Diam., in. ...	3	3¼	3½	3¾	4
Each	$18.00	20.00	23.00	25.00	30.00
Diam., in. ...	4¼	4½	5	5½	6
Each	$35.00	40.00	50.00	55.00	66.00

WIRE FLUE BRUSHES



Flat steel wire, single spiral.

For tubes, in.....1 to 6
No. 192 Per in. diameter.....$1.00

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BRASS VALVES

NEEDLE POINT VALVES

For Working Pressures Up to 125 Pounds.

Globe **Angle**

Globe or angle. Rough body, polished trimmings, female ends.

Size, in.	⅛	¼	⅜	½	¾
Size feed opening, in.	3/32	⅛	3/16	¼	⅜
Globe or angle...each,	$0.65	.75	.85	1.60	2.00

These valves are used for regulating gas and fuel oil feed.

CHECK VALVES

Horizontal **Angle**

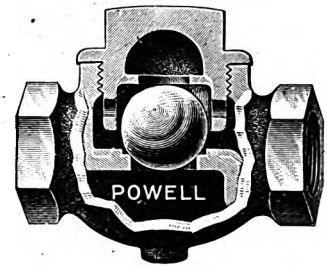
Size Inches	Horizontal Each	Angle Each	Size Inches	Horizontal Each	Angle Each
⅛	$0.65	$0.72	1¼	$2.25	$2.52
¼	.65	.72	1½	3.15	3.50
⅜	.70	.77	2	4.75	5.30
½	.90	1.00	2½	9.00	10.00
¾	1.15	1.26	3	13.00	14.40
1	1.60	1.85	..	....	....

Vertical

Size Inches	Each
¼	$0.72
⅜	.77
½	1.00
¾	1.26
1	1.80
1¼	2.52
1½	3.50
2	5.30

BALL CHECK VALVES

Horizontal



Screwed ends

Size	Horizontal Angle or Vertical Each	Horizontal with Drain Cock Each	Extra Valve Balls Each
⅛ in.	$0.85	....	....
¼ in.	.95	....	$0.20
⅜ in.	1.10	$1.50	.20
½ in.	1.60	2.00	.30
¾ in.	2.30	2.70	.55
1 in.	3.10	3.50	.70
1¼ in.	4.00	4.40	.90
1½ in.	6.20	6.60	1.25
2 in.	9.40	9.80	2.60

In ordering extra balls, be sure to give size of valve for which they are required.

No. 206 SAFETY VALVE

Made entirely of brass with ⅜ in. or ¼ in. I. P. thread, and has a soft seat suitable only for air and can be set to blow off at any desired pressure up to 150 pounds. This is an indispensable fitting for air tanks carrying high pressure.

Price .....each, $2.00

No. 222 POP VALVE

A smaller valve than the No. 206, with a ⅛ in. or ¼ in. I. P. thread, and ground seat and is suitable for either air or steam up to 50 pounds pressure.

Price .....each, $1.00

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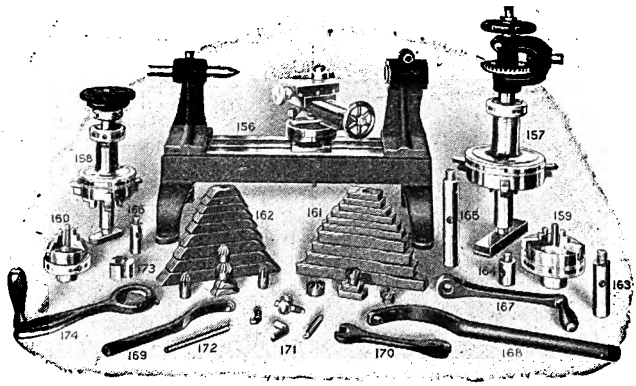
DEXTER VALVE RESEATING MACHINES

OUTFIT No. 6 T-L

Capacity for Reseating Globe Valves ¼ to 6 Inches



The Dexter machines recut a worn valve seat and disc accurately, making a perfect tight valve that will hold water or steam. The same valve can be recut from ten to twenty times. The saving of a few valves pays for a machine. Extensively used in mines, sugar mills, public institutions, railroads, ships and manufacturing plants.

Outfits for Flat and Taper-seated Globe, Angle, Safety and Cross Valves

Outfit number	3 T-L	4 T-L	6 T-L	8 T-L	10 T-L	12 T-L
For valves, size, in.	¼-3	¼-4	¼-6	¼-8	¼-10	¼-12
Each $	.....	.....	.....	.....	.....	.....

DEXTER PUMP VALVE RESEATING MACHINES

These machines recut the seats in all types of feed water, circulating and service pumps.

Pump Outfits Used Independently of Dexter Globe Valve Machines

Outfit number	K-4	H-6	D-H-6
Capacity for refacing seats, in.	2-3	2-4	2-7½
Without cutters each, $	.....	.....	.....

PUMP ATTACHMENTS

Attachment number	M-4	M-6	D-M-6
Capacity for refacing seats, in.	2-3	2-4	2-7½
Without cutters each, $	.....	.....	.....

S. & W. PATENT PUMP VALVE SEAT CUTTERS

Add price of pump cutters required to price of pump outfit or attachment.

Size, in.	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½
Each $	....	....	....	....	....	....	....	....	....	....	....	....

Give diameter of pump valve stud for each cutter.

Dexter Pump Outfits and Cutters can also be supplied for pump valve seats up to 14 inches.

Prices of Dexter Gate Valve Reseating Machines, capacity for refacing gate valves 1½ to 14 inches, on request.

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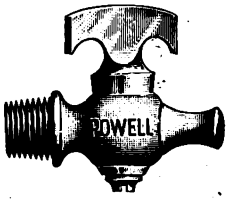
BRASS AIR COCKS

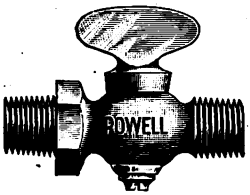
TEE HANDLE

Male Thread, One End



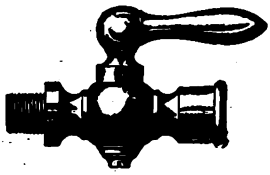
Size, in.	⅛	¼	⅜	½
Each	$0.40	.45	.50	.60

Male Thread, Both Ends



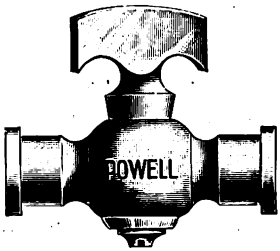
Size, in.	⅛	¼	⅜	½
Each	$0.55	.65	.75	.90

Male and Female Thread



Size, in.	⅛	¼	⅜	½
Each	$0.75	.80	.90	1.10

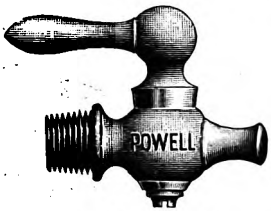
Female Thread, Both Ends



Size, in.	⅛	¼	⅜	½
Each	$0.65	.70	.85	1.05

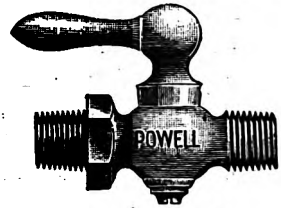
LEVER HANDLE

Male Thread, One End



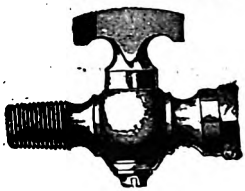
Size, in.	⅛	¼	⅜	½
Each	$0.55	.60	.65	.75

Male Thread, Both Ends



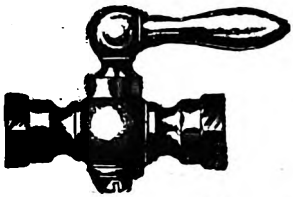
Size, in.	⅛	¼	⅜	½
Each	$0.70	.80	.90	1.05

Male and Female Thread



Size, in.	⅛	¼	⅜	½
Each	$0.90	.95	1.05	1.25

Female Thread, Both Ends



Size, in.	⅛	¼	⅜	½
Each	$0.80	.85	1.00	1.25

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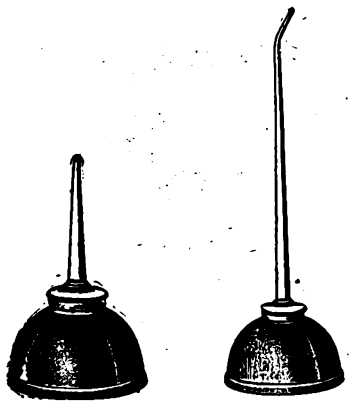
OILERS

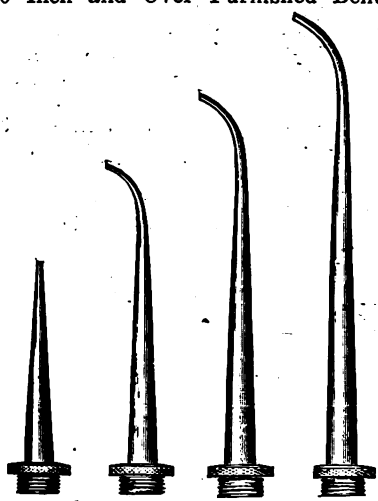
STEEL OILERS



No.	Capacity	Diameter Inches	Spout Inches	Per Doz.
12	3 oz.	2¾	3	$4.50
13	5 oz.	3⅜	3	5.50
13A	5 oz.	3⅜	5	6.00
14	5 oz.	3⅜	9	6.50
14A	½ pt.	3¾	3	7.50
14AA	½ pt.	3¾	5	8.00
14B	½ pt.	3¾	9	8.50
15	1 pt.	4¼	3	9.25
15A	1 pt.	4¼	5	9.75
16	1 pt.	4¼	9	10.50

WELDED STEEL SPOUTS

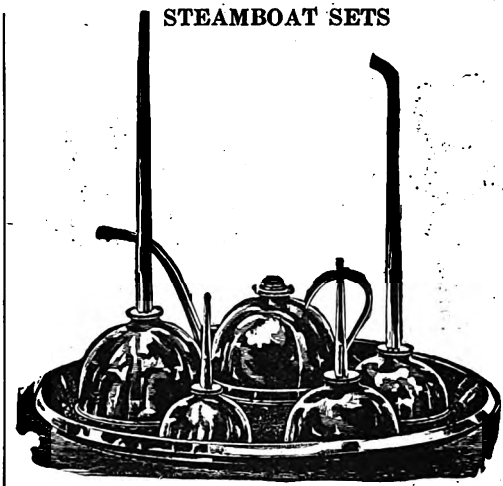
6 Inch and Over Furnished Bent



For steel oilers

Length, in....	2½	3	5	9	12	18
Per doz.....	$2.25	2.75	3.25	4.25	5.75	7.00

STEAMBOAT SETS



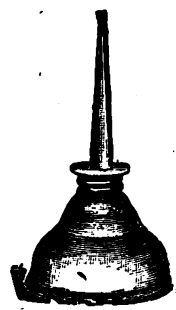
Brass Nickel Plated

No. 100 Six piece with round double bottom tray.....per set, $12.00

Steel Copper Plated

No. C70 Five piece with round double bottom tray.....per set, $6.00

CHASE PATTERN OILERS



With double seamed bottoms.

No.	Diameter Inches	Spout Inches	Per Doz.
00	2 1/16	1½	$1.00
0	2 3/16	1½	1.25
1	2⅝	3	1.50
1½	2⅞	3	1.75
2	3 3/16	4	2.00
3	3¾	4	2.25
4	4⅛	5	2.75
5	4½	5	3.50
6	4¾	5	4.50

TALLOW POTS

Brazed Steel

No.	40	41
Capacity, gal.	½	1
Per doz.	$15.00	18.00

Galvanized

Capacity, quarts.....	1	2	4
Per doz.	$....	....	....

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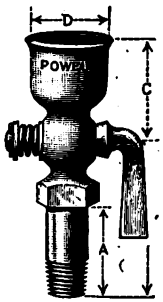
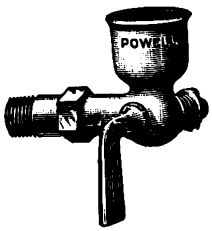
PRIMING, GREASE AND OIL CUPS

PRIMING CUPS





Upright **Angle**

With long or short shank.

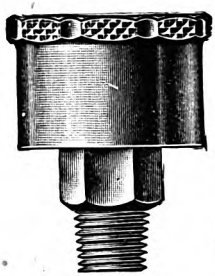
		Each
No. 1, Upright,	⅛ pipe thread	$0.30
No. 2, Upright,	¼ pipe thread	.40
No. 3, Angle,	⅛ pipe thread	.35
No. 4, Angle,	¼ pipe thread	.45

SNAP LEVER SIGHT-FEED OIL CUPS

This cup was especially designed to meet the demands for a high grade engine cylinder lubricator made entirely of cast brass, strong and durable, with ball to prevent back pressure in sight feed and will eliminate any lubricating trouble. We guarantee this cup.

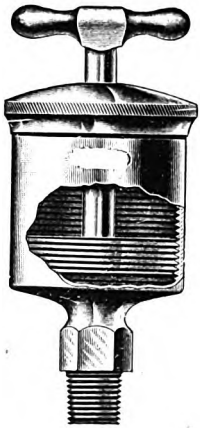
No.	O. D. Glass Inches	Capacity Oz.	Brass Each	Nickel Plate Each
1	1½	1	$3.50	$4.00
1½	1¾	1½	4.00	4.50
2	2	2½	5.00	5.50
3	2¼	4	5.50	6.00
4	2½	5	6.50	7.00
5	3	10	9.00	9.75
6	3½	pint	11.50	12.25

PLAIN COMPRESSION GREASE CUPS



No.	Diam. Inside Inches	Shank I. P. Inch	Grease Cap. Oz.	Brass Pol. Each	Nickel Plated Each
3/0	¾	⅛	¼	$0.40	$0.20
2/0	1	⅛	½	.50	.25
0	1¼	¼	⅔	.65	.35
1	1½	¼	1	.80	.45
2	2	⅜	2	1.05	.55
3	2½	½	3½	1.45	.80
4	3	½	5	2.00	1.05

MARINE COMPRESSION GREASE CUPS



Made expressly for feeding heavy grease and dope to bearings, and preferred in many cases to the spring compression cup, where the temperature is continually changing. This style of cup is strongly indorsed for marine purposes, being strong and well made. Guaranteed perfectly reliable for its many purposes.

No.	Inside Diam. Inches	I. P. Shank Inch	Cap. Grease Oz.	Pol. Brass Each	Nickel Plated Each
2/0	1	⅛	⅓	$1.00	$1.20
0	1¼	¼	1	1.20	1.45
1	1½	¼	1½	1.60	1.90
2	2	⅜	3	2.00	2.40
3	2½	½	6	2.80	3.40
4	3	½	10	4.00	4.75

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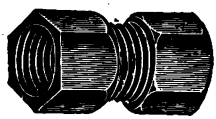
COMPRESSION COUPLINGS AND SEAMLESS TUBING

BRASS SOLDERLESS

No. 1376

No. 1377



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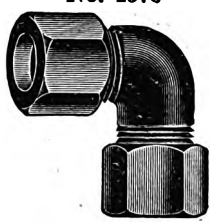
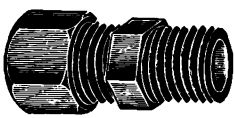
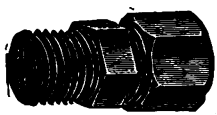


No. 1379

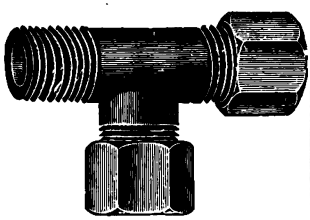
No. 1380



No. 1382



No. 1385



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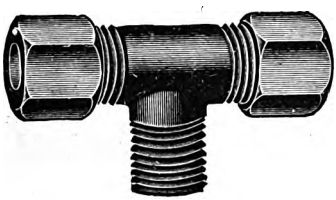
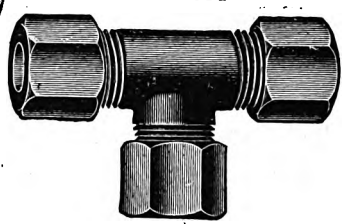


No. 1384

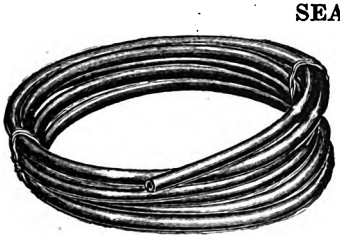


No. 1381 is same as 1376, but with female thread one end.

No.	⅛"P.T. for ¼" O. D. Tubing Per 100	⅛" P.T. for $\frac{3}{16}$" O. D. Tubing Per 100	¼" P.T. for ⅜" O. D. Tubing Per 100
1376 Elbow	$12.20	$14.20	$22.50
1377 Bushing	9.50	11.35	19.65
1378 Elbow	16.20	18.35	25.85
1379 Union	12.90	15.00	23.00
1380 Connector	9.70	11.35	19.65
1381 Elbow	15.00	16.70	24.70
1382 Check valve	12.90	15.00	23.00
1383 Tee one end P. T.	19.20	20.85	29.20
1384 Tee tubing three ends	21.35	23.35	30.85
1385 Tee one end P. T.	19.20	20.85	29.20

When ordering, state number and size tubing couplings are wanted for.

SEAMLESS ANNEALED TUBING



For gasoline and air lines.

Brass

O. D. inches	$\frac{3}{16}$	¼	$\frac{5}{16}$	⅜	½
Per lb. $	....	....	....	....	....

Copper

O. D. inches	$\frac{3}{16}$	¼	$\frac{5}{16}$	⅜	½
Per lb. $	....	....	....	....	....

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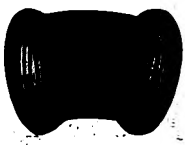
PIPE FITTINGS

Galvanized Malleable Iron and Polished Brass. Iron Pipe Thread

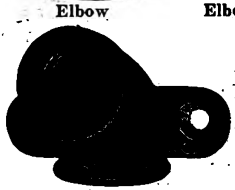
Elbow

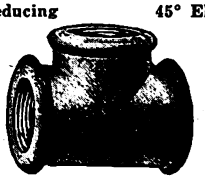
Elbow-Reducing


45° Elbow

Street Elbow

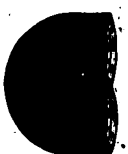
Unions—Ground Joint

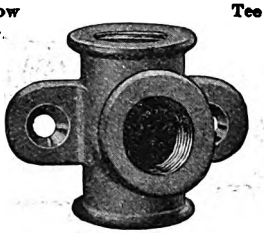

Drop Elbow


Tee

Tee—Reducing Outlet

Return Bend Open Pattern


Return Bend Close Pattern


Drop Tee

Cross

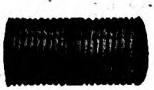
Coupling, Right

Reducer

Locknut

Bushing

Cap


Close Nipple

Shoulder Nipple

Size, In.	Galv.	Br.	Galv.	Br.	Galv.	Br.	Galv.	Br.	Galv.	Br.	Galv.	Br.	Galv.	Br.
	⅛		¼		⅜		½		¾		1		1¼	
Elbows		$0.24	.05	.34	.08	.42	.14	.56	.20	.70	.32	1.00	.40	1.70
Elbows, Reducing		...	.08	.44	.12	.52	.18	.70	.25	.90	.38	1.25	.48	2.20
Elbows, Side Outlet		...	...	...	.10	.96	.15	1.24	.24	1.76	.45	2.20	.70	3.10
Elbows, 45°		.36	...	.40	.15	.50	.20	.70	.25	1.00	.40	1.40	.50	2.10
Street Elbows		.66	...	.74	.12	.80	.15	1.10	.28	1.50	.35	2.00	.55	3.60
Drop Elbows		...	...	...	.12	1.05	.20	1.25	.35	1.65	.40	2.10	...	2.60
Tees		.30	...	.40	.10	.60	.16	.80	.20	1.00	.38	1.50	.50	2.00
Tees, Reducing		...	...	.50	.15	.76	.24	1.00	.30	1.25	.57	1.90	.75	2.50
Tees, Bullhead		...	...	.50	.15	.76	.24	1.00	.30	1.25	.57	1.90	.75	2.50
Drop Tees		...	...	...	.15	1.45	.25	1.70	.40	2.10	.55	2.50	..	3.25
Crosses		.53	...	.60	.15	.80	.17	1.00	.25	1.20	.45	1.60	.60	3.00
Unions	$0.27	.45	.27	.56	.30	.69	.33	.98	.40	1.31	.50	1.83	.70	2.62
Return Bend (close)		...	...	...	..	2.10	.25	2.50	.35	3.10	.55	3.75	.75	4.70
Return Bend (open)		...	...	...	..	2.15	.27	2.56	.40	3.20	.70	4.00	.90	5.25
Reducer		...	...	.32	.05	.44	.08	.64	.15	.90	.25	1.30	.35	1.80
Caps		.30	.04	.30	.05	.40	.08	.50	.12	.70	.17	.90	.24	1.20
Locknut		...	.03	.20	.04	.24	.05	.30	.07	.40	.10	.60	.14	.90
Close Nipple	.06	.16	.06	.20	.06	.23	.06	.30	.08	.32	.11	.40	.17	.63
Shoulder Nipple	.06	.22	.06	.28	.06	.33	.06	.42	.08	.46	.11	.58	.17	.75
Couplings	.05	.20	.05	.28	.07	.32	.10	.50	.17	.75	.23	1.00	.36	1.20
Couplings, Right & Left		...	.06	.31	.08	.36	.08	.55	.17	.82	.25	1.10	.35	1.35
Bushings		...	...	.20	.08	.24	.08	.28	.10	.42	.12	.76	.14	1.00
Plugs	.10	.18	.10	.20	.10	.24	.14	.30	.22	.40	.30	.56	.50	.80

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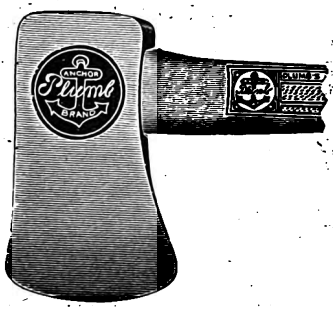
AXES, ADZES, HATCHETS AND HAMMERS

HANDLED AXES

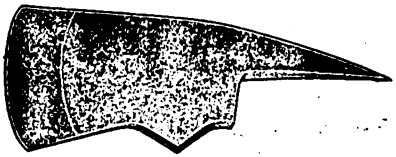


Michigan Pattern
Non rusting finish.
Weight 3½ to 4½ lbs.....per doz., $....

BOYS' AXES, HANDLED

Weight 2½ lbs.....per doz., $....

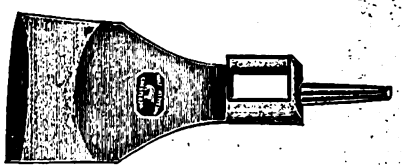
FIREMEN'S AXES



Red poll, polished bit, and 36 in. handle painted red.

Weight 4½ lbs.....per doz., $....

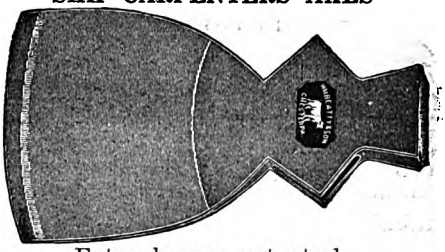
SHIP CARPENTERS' ADZES



Spur head, hand forged tool steel, plain bit.

Width cut, in.....	**4**	**4½**
Weight lbs.	**3**	**3**
Per doz. .....$....	**....**	**....**

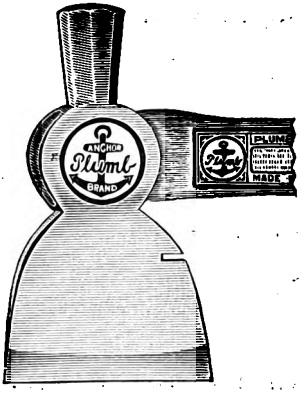
SHIP CARPENTERS' AXES



Extra heavy cast steel.

Width cut 6 in., weight 5 lbs. per doz., $....

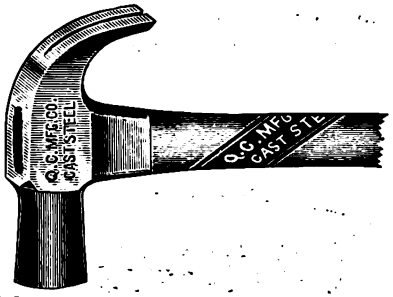
SHINGLING HATCHETS



Octagon poll, gold bronzed, with polished head and bit.

Size 2—3⅞ in. cut, 1 lb. 9 oz., per doz., $....

NAIL HAMMERS



Adze eye, plain poll, polished.

Size	**1**	**1½**	**2**
Weight	**1 lb. 4 oz.**	**1 lb. 1 oz.**	**13 oz.**
Per doz. .....$.....		**.....**	**.....**

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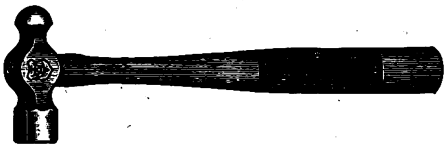
HAMMERS AND MAULS

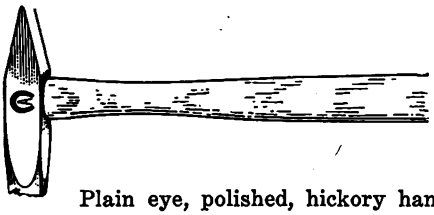
MACHINISTS' BALL PEIN HAMMERS



Crucible tool steel, drop forged, half polished.

Weight lbs.	¾	1	1½	2	2¼	2½
Per doz. ..$....	....	....	....	....	....	....

RIVETING HAMMERS



Plain eye, polished, hickory handle.

Weight, oz.	12	18	26
Per dozen .....$....	....	....	....

HAND DRILLING HAMMERS

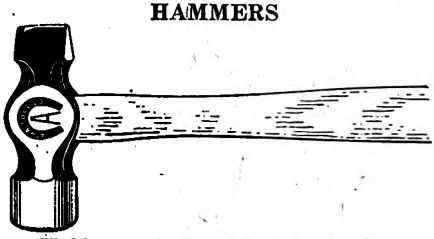
Weight, lbs.	3	3½	4
Handled, per doz.....$....	....	....	....

CHIPPING HAMMERS

Polished Steel

Size, Nos.	1	2	3
Weight, lbs.	1¼	1½	2
Per dozen .....$....	....	....	....

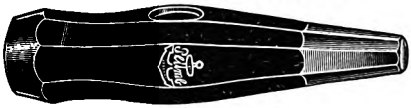
MACHINISTS' STRAIGHT PEIN HAMMERS



Half polished, hickory handle.

Weight, lbs.	¾	1	1½	2	2¼	2½
Per doz....$....	....	....	....	....	....	....

SHIP OR TOP MAULS



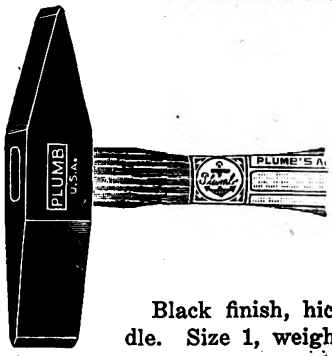
Octagon shape.

Size, lbs.	4	4½	5	5½	6
Per pound.....$....	....	....	....	....	....

COAL MAULS OR SLEDGES

Size, lbs.	5	6	8	10
Per pound .....$....	....	....	....	....

SCALING HAMMERS



Black finish, hickory handle. Size 1, weight 1 lb.

Per dozen .....$....

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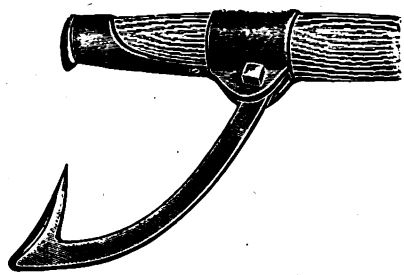
JACK SCREWS, LUMBERING TOOLS AND FORGES

LOCOMOTIVE JACK SCREWS

Size Inches	Height of Barrel Inches	Height Over All Inches	Rise of Screw Inches	Each
1½x6	6	8¾	3¾	$3.75
1½x8	8	10¾	5¾	4.25
1½x10	10	12¾	7¾	4.75
1½x12	12	14¾	9¾	5.25
1½x14	14	16¾	11¾	6.00
1½x16	16	18¾	13¾	6.75
1¾x 8	8	11	5½	5.00
1¾x10	10	13	7½	5.75
1¾x12	12	15	9½	6.25
1¾x14	14	17	11½	6.75
1¾x16	16	19	13½	7.50
2 x 8	8	11½	5	6.00
2 x10	10	13½	7	6.75
2 x12	12	15½	9	7.50
2 x14	14	17½	11	8.25
2 x16	16	19½	13	9.25
2 x18	18	21½	15	10.25
2 x20	20	23½	17	11.50
2¼x 8	8	11¾	4¾	7.50
2¼x10	10	13¾	6¾	8.25
2¼x12	12	15¾	8¾	9.00
2¼x14	14	17¾	10¾	10.00
2¼x16	16	19¾	12¾	11.00
2½x 8	8	12	4¼	8.75
2½x10	10	14	6¼	9.75
2½x12	12	16	8¼	10.75
2½x14	14	18	10¼	12.00
2½x16	16	20	12¼	13.75
2½x18	18	22	14¼	14.50
2½x20	20	24	16¼	15.75
2½x22	22	26	18¼	17.00
2½x24	24	28	20¼	18.25

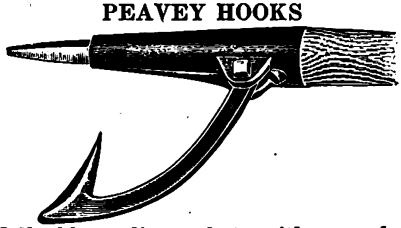
CANT HOOKS



Malleable iron clasps, with round bill hooks, maple handles, extension toe rings.

Nos.	222	223
Length handles, ft.	4½	5
Diam. handles, in.	2½	2½
Per dozen	$....	....

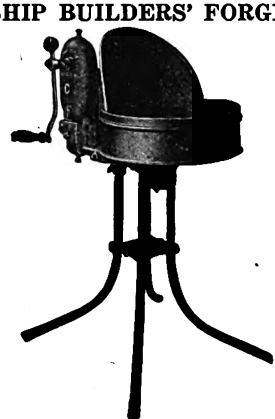
PEAVEY HOOKS



Malleable split socket with round bill hooks. Maple handle.

Nos.	5	6
Length handles, ft.	4½	5
Diam. handles, in.	2½	2½
Per dozen	$....	....

SHIP BUILDERS' FORGES



Equipped with No. 200 Silent Blower.

No.	Diam. of Fire Pan Inches	Diam. of Fan Inches	Weight Pounds	Each
625	22	12	120	$....

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AUGER BITS, HANDLES AND BRACES

JENNINGS PATTERN AUGER BITS

Size in 16ths	3	4	5	6	7	8	9	10	11	12	13
Per doz.	$5.00	5.00	5.00	5.00	5.00	5.00	6.00	6.00	7.00	7.00	8.25
Size in 16ths	14	15	16	17	18	19	20	21	22	24	
Per doz.	$8.25	9.50	9.50	12.00	12.00	14.00	14.00	16.00	16.00	18.00	...

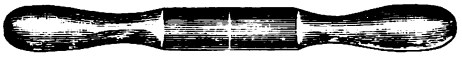
SHIP AUGERS—With Screw

Size in 16ths	4 to 10	11-12	13-14	15-16	17-18	19-20
Per doz.	$11.00	12.00	13.00	14.50	16.00	18.00
Size in 16ths	21-22	23-24	25-26	27-28	29-30	31-32
Per doz.	$20.00	23.00	27.00	32.00	38.00	45.00

SHIP AUGERS—Without Screw

Size in 16ths	4 to 10	11-12	13-14	15-16	17-18	19-20
Per doz.	$13.20	14.40	15.60	17.40	19.20	21.60
Size in 16ths	21-22	23-24	25-26	27-28	29-30	31-32
Per doz.	$24.00	27.60	32.40	38.40	45.60	54.00

AUGER HANDLES
Common



Selected hickory, polished, assorted 13 to 16 in.

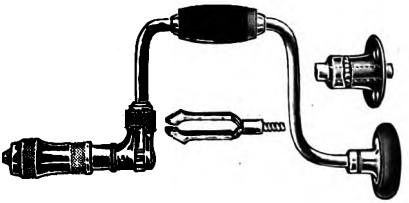
Per doz. .....$....

PRATT'S PATENT

Adjustable to all sizes of augers.

Nos.	1	2
Length in.	14	17
Per dozen	$7.60	8.00

BARBER RATCHET BRACES



Polished and nickeled steel, tropical wood center and ball bearing head, steel jaws, open ratchet.

No. 62 10 inch sweep.....per doz., $22.50

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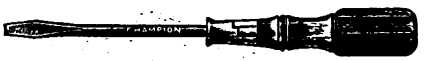
SCREWDRIVERS, MALLETS, ETC.

SCREWDRIVERS
Champion Regular



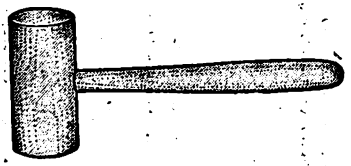
Blade in.	3	4	6	8
Per doz.	$3.50	4.25	6.00	8.00

Solbar

Solid steel bar construction. Wood handle.

Blade, in.	6	8	10	12
Per doz.	$6.00	8.00	10.00	12.00

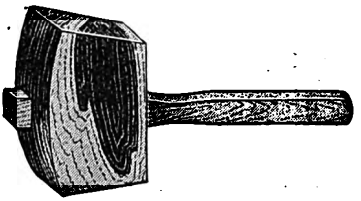
MALLETS
Tinners'



Round, second growth hickory.

Length of head, in.	6
Diam. of head, in.	2½
Per dozen	$2.25

Square



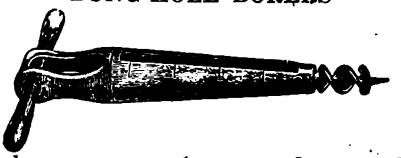
No.	Description	Heads Inches	Handles Inches	Per Dozen
8	Hickory	6 x2½x3½	10½	$4.00
9	Hickory	6½x2¾x3¾	13	5.00
10	Hickory	7 x3 x4	13	6.00
11	Lig. vitae	6 x2½x3½	10½	7.25
12	Lig. vitae	6½x2¾x3¾	13	9.25
13	Lig. vitae	7 x3 x4	13	11.25

BUNG STARTERS

Standard pattern, selected hickory heads, second growth hickory handles.

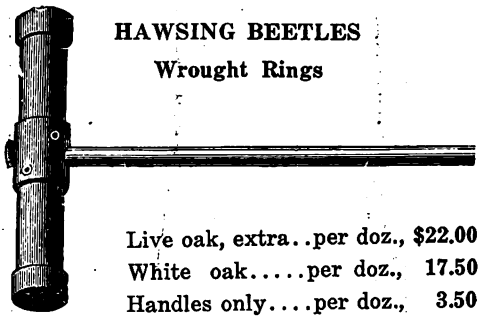
No. 1 Dovetailed head with screws.. .....per dozen, $12.00

BUNG-HOLE BORERS



Number	1	2	3
Cuts, in.	⅝ to 1½	1⅛ to 2	1½ to 3
Per doz.	$18.00	27.00	36.00

HAWSING BEETLES
Wrought Rings



Live oak, extra..per doz.,	$22.00
White oak.....per doz.,	17.50
Handles only....per doz.,	3.50

CAULKING MALLETS

Live Oak

No.		Per Doz.
000	Tempered steel rings..	$30.00
00	Tempered steel rings..	28.00
0	Polished steel rings....	25.00
1	Polished steel rings....	22.00
5	Iron rings	20.00

White Oak

9 Iron Rings	12.00
Handles only	....

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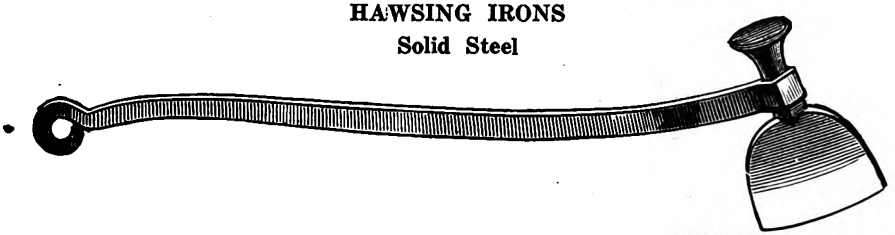
HAWSING AND CAULKING IRONS

HAWSING IRONS

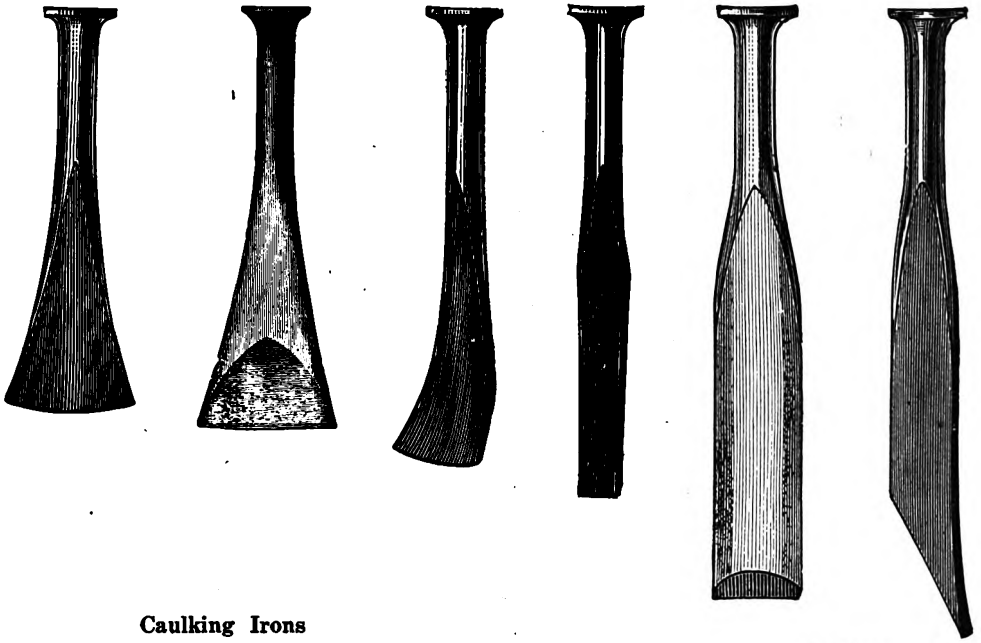
Solid Steel



	REGULAR 3/16 or 1/4 In. Thick Dozen	REGULAR 5/16 or 3/8 In. Thick Dozen	BENT Dozen
Blades, polished	$20.00	$22.50	$25.00
Blades, blacked	15.00	17.50	20.00

We always send ¼ inch thick blades unless otherwise ordered.

CAULKING IRONS



Caulking Irons

Nos.	0	1	2	3
Crease, in.	1/16	1/8	3/16	1/4
Steel .....per doz.,	$4.50	4.65	4.75	4.85
Drew's ...per doz.,	8.00	8.00	8.00	8.00

Boat Builders' Irons

Thickness, in.	1/32	1/16	1/8
Per dozen	$3.00	3.25	3.50

	Solid Steel Dozen	Drew's Dozen
Deck or dumb irons	$5.25	$9.00
Crooked or bent irons	5.25	9.50
Double bent irons	5.75	10.00
Spike irons	5.00	8.00
Sharp or butt irons	6.00	10.00
Clearing or reefing irons	5.25	9.00

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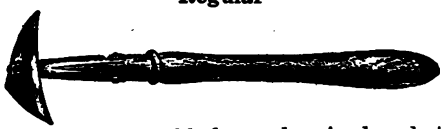
SHIP AND CABINET SCRAPERS

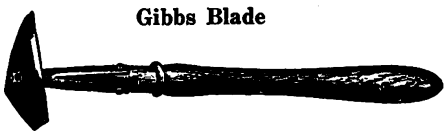
Regular



Tempered steel blades, galvanized sockets, wood handle.

		Complete Per Dozen	Blades Only Per Dozen
No. 1	Blade ¼x4½ in.....	$7.50	$5.00
No. 2	Blade ⅛x4½ in.....	4.50	3.00

Gibbs Blade



Tempered steel blades, galvanized sockets, wood handle.

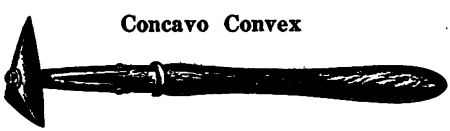
		Complete Per Dozen	Blades Only Per Dozen
No. 1	Blade ¼x4¾ in.....	$7.50	$5.00
No. 2	Blade ⅛x4¾ in.....	4.50	3.00

Square Blade

Tempered steel blades, galvanized sockets, wood handle.

	Per Dozen
No. 1 Blade ⅛x2½ in., complete....	$4.50
Extra blades	3.00

Concavo Convex



Tempered steel blades, galvanized sockets, wood handles. The peculiar form of the blade prevents chattering.

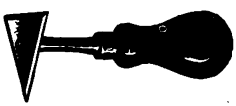
No. 4 Blade 4½ in.....per doz., $7.50

Yacht

Triangular steel blade, wood handles.

No. 5 Length over all 9½ in., size of blade 2¾x2¾ in.....per doz., $4.50

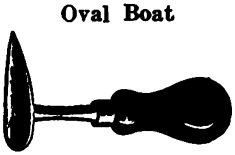
Triangular Boat



Tempered steel blade, wood handle.

No. 6 Length over all 5 in., size of blade 2x2 in. .....per doz., $3.50

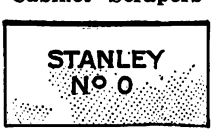
Oval Boat



Tempered steel blade, wood handle.

No. 7 Length over all 5 in., size of blade 2¼x1 in. .....per doz., $3.50

Cabinet Scrapers



Best tool steel, tempered and polished.

Size, in.	2½x5	3x4	3x5	3½x6
No. 8 Per doz.	$2.50	2.50	3.00	3.50

SHIP SCRAPERS

Peter Full's

Peter Full's Ship Scrapers furnished with either long or short handle. Prices on application.

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DRAWING KNIVES AND MACHINISTS' TOOLS

DRAWING KNIVES

Razor Blade

Length of blade,	7	8	9	10	12
Polished, doz.	$13.50	13.50	14.40	15.60	18.00

HACK SAW FRAMES

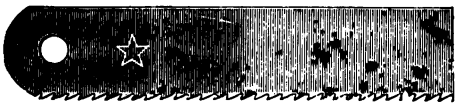
Millers Falls

Polished and nickeled steel stock, $\frac{3}{16}$x$\frac{11}{16}$ inch, tropical wood handle. Compact, stiff frame. Holds blades 8 to 12 inches long and has scale with different lengths on back. Blades can be faced in four directions. One 10 inch blade in each frame.

No. 10.....per doz., $15.50

HACK SAW BLADES

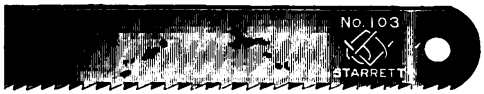
Star



Made from the highest grade of steel according to a special formula. Highly tempered, perfectly toothed with patent set.

Length, in.	9	10	12
Width, in.	⅜	½	½
Teeth per in.	14	14	14
Per gross	$9.00	10.00	12.00

Starrett's

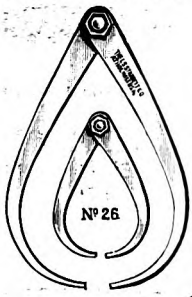


Made from finest grade of steel for general use in hand frames.

Length, in.	9	10	12
Width, in.	$\frac{7}{16}$	½	½
Teeth per in.	18	18	18
Per gross	$9.00	10.00	12.00

IMPROVED FIRM JOINT CALIPERS

No. 26—Outside No. 27—Inside



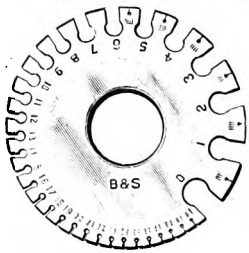
Outside

Size, in.	3	4	5	6	8	10
No. 26 Each	$0.40	.50	.55	.65	.80	.90
Size, in.	12	14	16	18	20	24
No. 26 Each	$1.00	1.50	1.75	2.10	2.50	3.00

Inside

Size, in.	3	4	5	6	8	10
No. 27 Each	$0.40	.50	.55	.65	.80	.90
Size, in.	12	14	16	18	20	24
No. 27 Each,	$1.00	1.50	1.75	2.10	2.50	3.00

AMERICAN STANDARD WIRE GAUGES



These gauges are made from the best steel and are tempered, adjusted and warranted accurate. The decimal equivalents are stamped on reverse side.

No. 688 Nos. 0 to 36 ...each, $2.50

U. S. STANDARD GAUGES

For sheet and plate iron and steel.

No. 694 Nos. 0 to 36 ...each, $2.50

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LIST PRICE OF FILES AND RASPS

Adopted by the File Manufacturers' Association of the United States, as their Selling List per Dozen, to take effect on and after November 1st, 1899.

(Revised and Reprinted January 1st, 1919)

INCH	MILL			MILL 1 R. E.		MILL 2 R. E.		MILL BLUNT		TAPERS		HAND-SAW BLUNT	SLIM TAPER	EXTRA SLIM TAPER	TAPER HEAVY	BANDSAW BLUNT & TAPER		PITSAW
	BAST.	2d CUT	SMOOTH	BAST.	2d CUT	BAST.	2d CUT	BAST.	2d CUT	SGL. CUT	DBL. CUT					REGULAR	SLIM	
3										2.10	2.50		2.10		2.10			
3½										2.10	2.50		2.10		2.10			
4	3.00									2.20	2.90	2.60	2.20	2.20	2.20	2.90		4.80
4½										2.40	3.10	3.00	2.30	2.30	2.40	3.10		5.40
5	3.20									2.60	3.50	3.40	2.50	2.50	2.60	3.50		5.40
5½										3.00			2.90	2.90	3.00			6.10
6	3.50	4.00	4.50	3.90	4.50	4.40	5.00	3.90	4.60	3.40	4.70	4.30	3.10	3.10	3.40	4.70	3.90	6.10
7	3.90	4.60	4.90	4.40	5.20	4.90	5.80	4.30	4.90	4.30	5.60	5.40	3.80	3.80	4.30	5.60		
8	4.30	4.90	5.40	4.80	5.50	5.40	6.10	4.90	5.80	5.40	6.70	6.60	4.50	4.50	5.40	6.70	5.30	7.50
9	4.90	5.80	6.30	5.50	6.50	6.10	7.30	5.60	6.40									
10	5.60	6.40	7.00	6.30	7.20	7.00	8.00	6.70	7.80	8.10			6.40		8.10	CROSSING BAST		
12	7.50	8.60	9.40	8.40	9.70	9.40	10.80	9.40	10.70	12.50			9.50			15.50		
14	10.70	12.20	13.10	12.00	13.70	13.40	15.30									20.60		
16	14.70	16.80	17.90													27.50		
18	20.20																	

INCH	FLAT			HAND			SQUARE			THREE SQUARE			HALF ROUND			ROUND		
	BAST.	2d CUT	SMOOTH	BAST.	2d CUT	SMOOTH	BAST.	2d CUT	SMOOTH	BAST.	2d CUT	SMOOTH	BAST.	2d CUT	SMOOTH	BAST.	2d CUT	SMOOTH
4	3.70	4.30	4.70	3.70	4.30	4.80	3.80	4.60	4.90	4.80	5.60	6.10	4.80	5.60	6.10	3.00	3.50	3.90
5	3.90	4.60	4.90	3.90	4.70	5.30	4.10	4.80	5.30	5.40	6.10	6.40	5.40	6.10	6.40	3.20	3.80	4.10
6	4.30	4.80	5.30	4.30	5.10	5.60	4.60	5.10	5.50	6.10	6.70	7.10	6.10	6.70	7.10	3.50	4.00	4.50
7	4.80	5.50	6.10	4.90	5.80	6.30	5.10	5.80	6.30	7.00	7.70	8.20	7.00	7.70	8.20	3.90	4.60	4.90
8	5.30	6.10	6.60	5.40	6.30	6.70	5.50	6.30	7.00	7.50	8.30	8.90	7.50	8.30	8.90	4.30	4.90	5.40
9	6.30	7.20	7.90	6.70	7.80	8.30										4.90	5.80	6.30
10	7.00	8.10	8.70	7.50	8.70	9.40	7.40	8.50	9.10	9.10	10.10	10.70	9.10	10.10	10.70	5.60	6.40	7.00
11	8.60																	
12	9.70	11.00	12.10	10.70	12.30	13.50	10.20	11.50	12.80	11.80	13.00	13.90	11.80	13.00	13.90	7.50	8.60	9.40
13	11.80																	
14	13.30	15.30	16.70	15.00	17.00	18.20	13.90	16.10	17.50	15.50	17.00	18.30	15.50	17.00	18.30	10.70	12.20	13.10
16	17.80	20.10	22.30	20.10	22.80	24.20	18.70	21.20	23.30	20.60	22.50	24.20	20.60	22.50	24.20	14.70	16.80	17.90
18	23.90	26.80	29.20	26.80	29.90	31.50	25.10	28.20	30.40	27.50	29.90	32.00	27.50	29.90	32.00	20.20	22.70	24.30
20	31.50	35.30	38.30	35.10	39.20	41.60	32.80	36.70	39.30	36.20	39.40	42.30	36.20	39.40	42.30	27.40	30.70	32.90

INCH	PILLAR			WARDING			KNIFE			SQUARE BLUNT	ROUND BLUNT	HAND FINISHING		FLAT DEAD	HAND DEAD	HALF RD. DEAD	LEAD FLOAT AND WOOD FILES	
	BAST.	2d CUT	SMOOTH	BAST.	2d CUT	SMOOTH	BAST.	2d CUT	SMOOTH	BAST.	BAST.	2d CUT	SMOOTH	SMOOTH	SMOOTH	SMOOTH	FLAT	HF. RD.
4				4.00	4.80	5.40	5.40	6.10	6.40									
5				4.50	5.30	5.80	6.10	6.70	7.10									
6	4.30	5.10	5.60	4.90	5.90	6.40	6.90	7.50	7.90	5.50							4.80	7.00
8	5.40	6.30	6.70	6.40	7.50	8.20	8.50	9.10	9.50	7.40	5.60	7.80	8.30	10.60	10.80	15.00	6.30	8.50
10	7.50	8.70	9.40	8.70	10.10	11.00	10.10	11.50	12.30	10.20	7.50	10.90	11.80	14.00	15.00	18.20	8.60	10.70
12	10.70	12.30	13.50				13.70	15.20	16.10	13.90	10.70	15.20	16.20	19.40	21.40	23.60	11.80	14.10
14	15.00	17.00	18.20							18.70	14.70	20.60	21.70	26.60	30.00	31.00	16.00	18.50
16	20.10	22.80	24.20							25.10							21.50	24.70
18										32.80								

INCH	DOUBLE ENDER	CANT SAW	CROSS CUT	HOOK TOOTH	PLANER KNIFE	CABINET FILES	CABINET RASPS		FLAT SGL. CUT COARSE and BAST.	FLAT OPEN CUT			HALF ROUND OPEN CUT			HALF RD. WOOD RASPS		
							2d CUT	SMOOTH		BAST.	2d CUT	SMOOTH	BAST.	2d CUT	SMOOTH	BAST.	2d CUT	SMOOTH
6		5.40				8.10	10.10	11.70								8.10	9.30	10.10
7	3.50																	
8	3.90	6.40	7.50	8.30	6.40	10.10	12.80	15.50	6.30	6.30	7.20	7.90	8.50	9.40	9.90	10.10	12.20	13.70
9	4.40																	
10	4.90	8.70	9.10	10.10	8.60	13.70	17.50	20.70	8.60	8.60	9.80	10.70	10.70	11.80	12.70	13.70	16.80	18.70
12						18.70	22.80	26.80	11.80	11.80	13.60	14.70	14.10	15.40	16.60	18.70	22.40	24.80
14						24.80	29.60	33.90	16.00	16.00	18.30	20.00	18.50	20.40	21.70	24.80	29.70	32.90
16																32.90	38.90	43.60

INCH	FLAT WOOD RASPS		HORSE RASPS PLAIN			HORSE RASPS PLAIN SLIM				HORSE RASPS				SHOE RASPS	
	BAST.	2d CUT	½ FILE	¼ FILE	REVERSE			½ FILE	¼ FILE	TANGED	TANGED SLIM		TANGED THIN	FLAT	HF. RD.
8	9.40	11.40												10.10	10.10
9														12.20	12.20
10	12.80	15.50												13.70	13.70
12	17.50	20.90	12.80	14.40						16.80			1.531"x .270"	16.00	
13										19.60			1.594"x .275"	18.20	
14	23.20	27.80	17.80	20.10	17.80					23.10	14"from12"stock	21.90	1.750"x .280"	21.90	
15			20.90	23.60	20.90										
16	30.80	36.20	24.40	27.50	24.40	10"from14"stock		21.50	24.60	32.20	16"from14"stock	29.70	1.875"x .290"	29.70	
18			32.90	36.20		12" " 15" "		25.90	28.50						
20						20" " 18" "		32.90							

The above list comprises all of the kinds, sizes and cuts of files that will be regularly carried in stock by the manufacturers. Anything differing from these files will be considered as special and will not be manufactured except in case of urgent necessity and when manufactured price will be based strictly upon cost of material and cost of manufacture at time goods are made.

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FILES, HANDLES AND CARDS

SLIM TAPER FILE

Length, inches	3	3½	4	4½	5	5½	6	7	8	10
Per dozen	$2.10	2.10	2.20	2.30	2.50	2.90	3.10	3.80	4.50	6.40

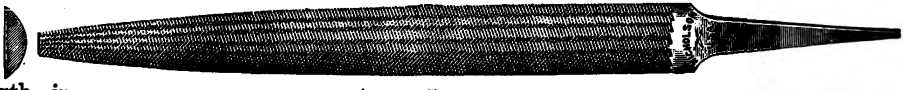
REGULAR TAPER FILE

Length, in.	3	3½	4	4½	5	5½	6	8	10	12
Per dozen	$2.10	2.10	2.20	2.40	2.60	3.00	3.40	5.40	8.10	12.50

FLAT BASTARD FILE

Length, in.	4	5	6	7	8	9	10	12	14	16	18
Per dozen	$3.70	3.90	4.30	4.80	5.30	6.30	7.00	9.70	13.30	17.80	23.90

HALF ROUND BASTARD FILE



Length, in.	4	5	6	7	8	10	12	14	16
Per dozen	$4.80	5.40	6.10	7.00	7.50	9.10	11.80	15.50	20.60

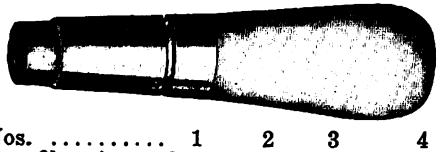
ROUND BASTARD FILE

Length, in.	4	5	6	7	8	10	12	14	16
Per dozen	$3.00	3.20	3.50	3.90	4.30	5.60	7.50	10.70	14.70

SQUARE BASTARD FILE

Length, in.	4	5	6	7	8	10	12	14	16
Per dozen	$3.80	4.10	4.60	5.10	5.50	7.40	10.20	13.90	18.70

LUTZ FILE HANDLES



Nos.	1	2	3	4
For files, in.	3 to 6	6 to 8	8 to 12	12 to 18
Per doz.	$....	....	....	....

FILE CARDS

With Scorer

Per doz. $4.50

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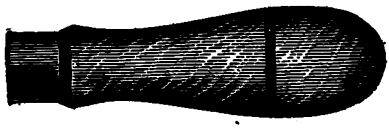
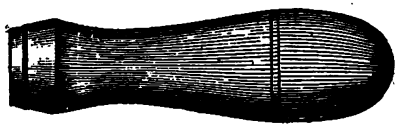
HANDLES AND DECK PLUGS

COMMON FILE HANDLES



Small, medium and large. Soft wood with ferrules .....per doz., $....

SOLDERING COPPER HANDLES



Per doz. .....$....

SOCKET FIRMER CHISEL HANDLES

Five sizes, for chisels ⅛ to 2 in.....
.....per doz., $....

TANGED FIRMER CHISEL HANDLES

Five sizes, for chisels ⅛ to 2 in.....
.....per doz., $....

BRUSH HANDLES

Length, feet	6	8	10	12
No. 1 Selected hardwood .....per dozen, $....	....	....	....	....

BROOM HANDLES

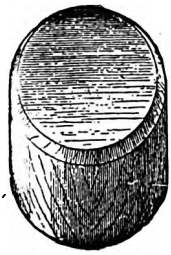
Length, feet	4	4½	5	6
No. 1 Selected hardwood .....per dozen, $....	....	....	....	....

MOP HANDLES

Length, feet	4	4½	5
No. 1 Selected hardwood .....per dozen, $....	....	....	....

DECK PLUGS

Prices Are Per 1000



	⅜	7/16 and ½	⅝	¾	⅞	1	1⅛	1¼	1⅜	1½
White pine ..	$1.00	1.00	1.00	1.00	1.00	1.00	1.75	2.00	2.75	3.50
Hard pine ...	1.50	1.50	1.50	1.75	2.00	2.50	3.00	3.00	...	...
Oak	1.50	1.50	1.50	2.00	2.00	2.75	3.50	3.75	...	...
Cypress	1.75	1.75	1.75	2.00	2.00	2.50	2.50	3.50	...	...
Ash	1.50	1.50	1.50	2.00	2.25	2.75	...	...	...	...
Mahogany ...	2.50	2.50	2.50	3.50	3.50	4.00	...	...	...	...
Black walnut.	2.50	2.50	2.50	3.00	3.75	4.25	...	...	...	...
Cherry	3.00	3.00	3.00	3.50	4.00	4.00	...	...	...	...

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HANDLES

SINGLE BIT AXE HANDLES

Length, inches, turned white hickory	34	36
Per dozen	$....	....

BOYS' AXE HANDLES

Length, in.	28	30
Per dozen	$....	....

ADZE HANDLES

Length, 34 inches, turned white hickory.....per dozen, $....

BROAD AXE HANDLES

Length, 36 inches, turned white hickory.....per dozen, $....

MAUL AND SLEDGE HANDLES

Length, inches., turned white hickory	30	32	34	36
Per dozen	$....	....	....	....

MACHINISTS' HAMMER HANDLES

Turned white hickory

Length, in.	10	12	14	16
No. 1 Per doz.	$....	....	....	....
Length, in.	18	20	22	24
No. 1 Per doz.	$....	....	....	....

ADZE EYE NAIL HAMMER HANDLES

Turned white hickory

Length, in.	12	14
No. 1 Per doz.	$....	....

SHINGLING HATCHET HANDLES

Turned white hickory

Length, in.	12	14
No. 1 Per doz.	$....	....

BENCH HATCHET HANDLES

Length, in.	16	18
No. 1 Per doz.	$....	....

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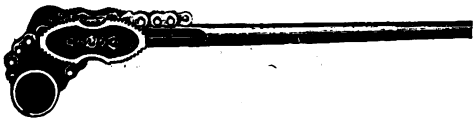
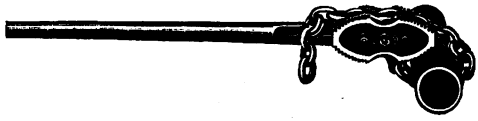
PIPE WRENCHES

IMPROVED VULCAN CHAIN PIPE WRENCHES

With Flat Link Chain

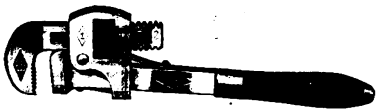


With Cable Chain



Numbers	30	31	32	33	33½	34	35
Capacity, in.	⅛ to ¾	⅛ to 1½	¼ to 2½	¾ to 4	1 to 6	1½ to 8	2 to12
Length, in.	13¾	20	27	37	44½	50½	64½
Weight, lbs.	2⅜	5¾	10	16	24	31	50
With flat or cable chains, ea.	$2.50	3.50	5.00	7.00	9.00	11.00	18.00
Extra chains, each	.75	1.00	1.50	2.50	3.50	4.50	7.50
Extra jaws, per pair	1.00	1.75	2.75	4.00	4.75	5.50	7.50
Extra nuts and studs for jaws per set	.20	.25	.35	.45	.55	.70	.90

STILLSON PIPE WRENCHES



Wood handle, sizes 6, 8, 10, 14 inch

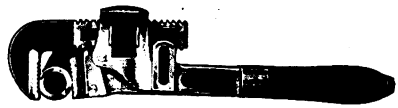
Steel handle, all sizes

Length Inches	Takes Pipe Inches	Weight Pounds	Each
6	⅛ to ½	¼	$2.00
8	⅛ to ¾	½	2.25
10	⅛ to 1	1¼	2.50
14	¼ to 1½	2	3.50
18	¼ to 2	4	5.00
24	¼ to 2½	6½	7.25
36	¼ to 3½	15	13.50
48	1 to 5	23	20.00

Extra Parts

Inches	6	8	10	14	18	24	36	48
Movable jaw	$0.75	.75	.85	1.15	1.75	2.25	4.35	7.50
Frames	.38	.42	.50	.60	.75	.95	1.70	2.20
Adjust. nuts	.12	.15	.20	.30	.35	.55	1.10	1.50
Wood handles	.16	.16	.18	.25	.28	...	...	...
End nuts	.15	.15	.20	.20	.20	...	...	...
Frame pins	.03	.03	.04	.04	.04	.04	.05	.05
Spring rivets	.01	.01	.02	.02	.02	.02	.02	.04
Springs	.10	.10	.10	.10	.10	.11	.13	.13

TRIMO PIPE WRENCHES



Wood handle, 6, 8, 10, 14 inches

Steel handle, all sizes

Length Open Inches	Capacity Pipe Inches	Weight Pounds	Each
6	⅛ to ½	7/16	$2.00
8	⅛ to ¾	¾	2.25
10	⅛ to 1	1½	2.50
14	¼ to 1½	3	3.50
18	¼ to 2	5	5.00
24	¼ to 2½	8½	7.25
36	½ to 3½	16¾	13.50
48	1 to 5	24	20.00

Extra Parts

Inches	6	8	10	14	18	24	36	48
Moveable jaw	$0.75	.80	.85	1.15	1.75	2.25	4.35	7.50
Nuts	.12	.15	.20	.30	.35	.55	1.10	1.50
Ins. jaw	.35	.40	.50	.60	.70	.80	1.10	2.00
Frames	.38	.42	.50	.60	.75	.95	1.70	2.20
Springs	.03	.03	.03	.03	.04	.04	.04	.04
Frame pins	.03	.03	.04	.04	.04	.04	.05	.05
Jaw pins	.03	.03	.04	.04	.04	.04	.05	.05
Steel handles	.95	1.00	1.10	1.50	2.25	3.50	7.00	10.50
Wood handles	.16	.16	.18	.25	...	...	...	...
Nut guards	.15	.15	.20	.30	.35	.45	.55	.65

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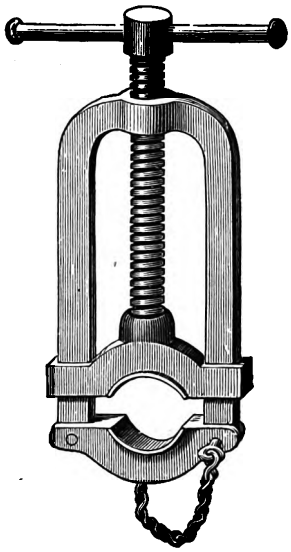
RIGGER AND CLAMP SCREWS

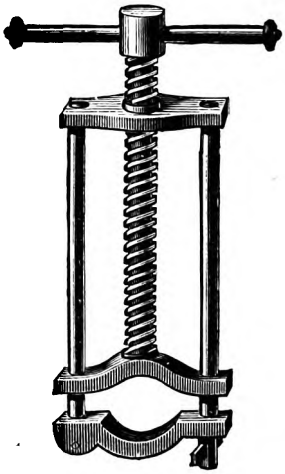
WROUGHT IRON RIGGER SCREWS

For Manila Rope



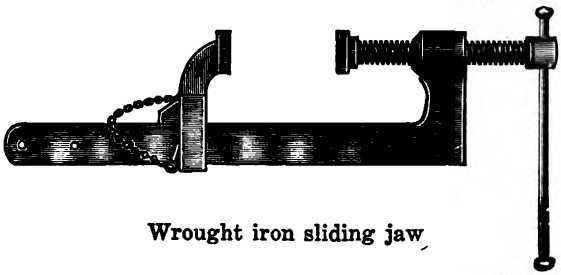
Size No.	Diam. Screw Inches	Diam. Rope Inches	Each
0	1½	3	$13.50
1	1¼	2½	9.50
2	1⅛	2	7.50
3	1	1¾	6.50
4	⅞	1½	5.50

For Wire Rope



Size No.	Diam. Screw Inches	Diam. Rope Inches	Each
0	1½	2¼	$9.00
1	1¼	2	6.25
2	1⅛	1¾	5.00
3	1	1½	4.40
4	⅞	1¼	3.75
5	¾	1⅛	3.25

SHIP CARPENTERS' CLAMP SCREW



Wrought iron sliding jaw

No	Size of Frame Inches	Diameter of Screw Inches	Space in Clear Inches	Each
1	3 x ¾	1½	30	$14.25
2	3½x ⅞	1¾	36	17.75
3	4 x1	2	36	20.00

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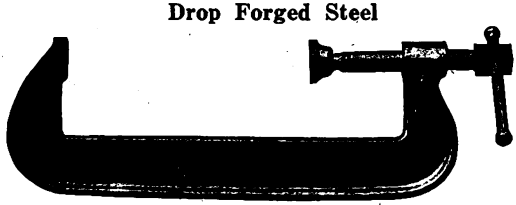
CLAMPS, VISES AND WRENCHES

CLAMPS

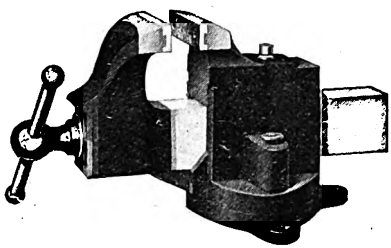
Drop Forged Steel



Nos.	2	3	4	5	6
Opens, in.	3	4	5	6	8
Each	$2.00	2.25	2.50	2.75	3.25
Nos.	7	8	9	10	11
Opens, in.	10	12	14	16	18
Each	$3.75	4.25	5.00	6.00	7.00

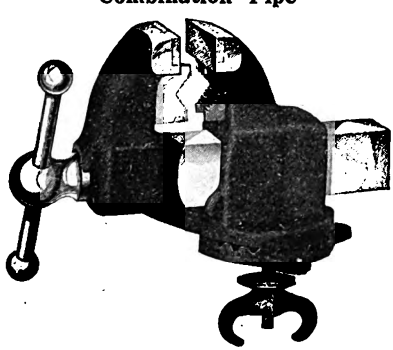
VISES

Swivel Base and Swivel Jaw



No.	Width of Jaw, Inches	Opens Inches	Weight Pounds	Each
408	8	12	300	$45.00

Combination Pipe



The front pipe jaw is reversible so it can be turned if desired.

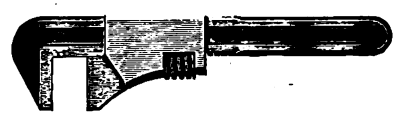
No.	Width Jaws Inches	Holds Pipe Inches	Weight Pounds	Each	Extra Jaws Per Set
206	6	⅛ to 6	178	$45.00	3.00

WRENCHES

Coes Knife Handle

Length Inches	Opens Inches	Per Dozen	Length Inches	Opens Inches	Per Dozen
6	⅞	$10.00	15	2⅝	$24.00
8	1¼	12.00	18	3	32.00
10	1¾	14.00	21	4⅛	39.00
12	2⅛	18.00			

All Steel Adjustable Wrenches



No.	Size Inches	Total Length Inches	Opens Inches	Thickness of Jaw Inches	Depth of Jaw Inches	Semi-Finished Per Doz.
1	6	6½	1 11/16	5/16	1	$7.00
2	8	8	1½	⅜	1¼	9.00
3	10	10¾	2 7/16	7/16	1½	10.00
4	12	12¼	2¾	7/16	1½	15.00
5	14	14¾	2 13/16	9/16	1¾	20.00
6	18	18¾	3 3/16	¾	2⅛	28.00

PIPE CUTTERS

No.	Cuts Pipe Inches	Weight Pounds	Each
1	⅛ to 1	3	$3.00
2	1 to 2	6	4.50
3	2 to 3	11	11.00
4	2½ to 4	15	18.00
5	4 to 6	23	28.00

Extra Parts

No.	Wheels Each	Swing and Wheel	Rolls Each	Pins Each	Handles Each
1	$0.24	$1.25	$0.24	$0.10	$1.00
2	.32	1.75	.32	.10	1.25
3	.60	2.75	.50	.15	1.75
4	.60	3.50	.50	.15	3.50
5	.60	4.00	.60	.15	5.00

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WRENCHES

15° ANGLE, DOUBLE HEAD

No.	For U. S. Stand. Nut Size Bolts Inches	Opening Milled Inches	Extreme Length Inches	Unfinished Each	Semi-finished Each	Finished Each
21	1/8-3/16	5/16-13/32	3½	$0.12	$0.17	$0.26
22	1/8-¼	5/16-½	4	.14	.21	.32
23	3/16-¼	13/32-½	4	.14	.21	.32
24	3/16-5/16	13/32-19/32	5	.17	.25	.38
25	¼-5/16	½-19/32	5	.17	.25	.38
26	¼-⅜	½-11/16	6	.21	.31	.46
27	5/16-⅜	19/32-11/16	6	.21	.31	.46
28	5/16-7/16	19/32-25/32	7	.25	.37	.56
29	⅜-7/16	11/16-25/32	7	.25	.37	.56
30	⅜-½	11/16-⅞	8	.30	.45	.68
31	7/16-½	25/32-⅞	8	.30	.45	.68
32	7/16-9/16	25/32-31/32	9	.37	.55	.85
33	½-9/16	⅞-31/32	9	.37	.55	.85
34	½-⅝	⅞-1 1/16	10	.46	.68	1.08
35	9/16-⅝	31/32-1 1/16	10	.46	.68	1.08
36	9/16-¾	31/32-1¼	11½	.66	.96	1.40
37	⅝-¾	1 1/16-1¼	11½	.66	.96	1.40
38	⅝-⅞	1 1/16-1 7/16	13	1.00	1.40	1.90
39	¾-⅞	1¼-1 7/16	13	1.00	1.40	1.90
40	¾-1	1¼-1⅝	15	1.40	1.90	2.60
41	⅞-1	1 7/16-1⅝	15	1.40	1.90	2.60
42	⅞-1⅛	1 7/16-1 13/16	17	1.90	2.65	3.50
43	1 -1⅛	1⅝-1 13/16	17	1.90	2.65	3.50
44	1 -1¼	1⅝-2	19	2.60	3.60	4.70
45	1⅛-1¼	1 13/16-2	19	2.60	3.60	4.70
46	1⅛-1⅜	1 13/16-2 3/16	21	3.80	5.25	6.70
47	1¼-1⅜	2 -2 3/16	21	3.80	5.25	6.70
48	1¼-1½	2 -2⅜	23	5.20	7.00	8.80
49	1⅜-1½	2 3/16-2⅜	23	5.20	7.00	8.80
50	1⅜-1⅝	2 3/16-2 9/16	25	6.75	9.00	11.25
51	1½-1⅝	2⅜-2 9/16	25	7.40	9.90	12.40
52	1½-1¾	2⅜-2¾	27	8.35	11.00	13.65
53	1⅝-1¾	2 9/16-2¾	27	9.00	12.00	15.00
53½	1⅝-1⅞	2 9/16-2 15/16	27	10.00	13.00	16.00
54	1⅝-2	2 9/16-3⅛	31	11.00	14.25	17.50
55	1¾-2	2¾-3⅛	31	12.00	15.50	19.00
55½	1⅞-2	2 15/16-3⅛	31	13.50	17.00	20.50
56	1¾-2¼	2¾-3½	34	16.00	20.00	24.00
56½	1⅞-2¼	2 15/16-3½	34	17.00	21.00	25.00
57	2 -2¼	3⅛-3½	37	18.50	23.50	28.50
57½	2 -2½	3⅛-3⅞	37	23.00	28.00	33.00

GENERAL PURPOSE WRENCHES

22½ Degree

No.	Standard Nut, Bolt Inches	Length Inches	Semi-finished	Finished
300	3/16 and ¼	6¼	$0.27	$0.38
301	¼ and 5/16	7⅛	.34	.47
302	5/16 and ⅜	8¼	.43	.58
303	⅜ and 7/16	9¼	.55	.72
304	7/16 and ½	10⅜	.70	.90

SINGLE HEAD SOCKET WRENCHES

No.	For U.S. St. Nut Size Bolt	For Cap Screw Diam. Screw	Broached Opening	Unfinished Each	Semi-Finished Each	Finished Each
961A	⅛	...	21/64	$0.30	$0.40	$0.50
962D	...	3/16	29/64	.33	.44	.55
963A	3/16	...	37/64	.37	.49	.61
963D	...	¼	29/64	.37	.49	.61
964A	¼	5/16	33/64	.39	.52	.65
965D	...	⅜	37/64	.43	.58	.72
965A	5/16	...	39/64	.43	.58	.72
966D	...	7/16	41/64	.47	.63	.79
967A	⅜	...	49/64	.53	.71	.89
967D	...	½	49/64	.53	.71	.89
968A	7/16	...	51/64	.57	.77	.97
968D	...	9/16	53/64	.57	.77	.97
969A	½	⅝	57/64	.64	.87	1.10
970A	9/16	...	63/64	.72	.98	1.24
970D	...	¾	1 1/64	.72	.98	1.24
971A	⅝	...	1 5/64	.80	1.10	1.40
971D	...	⅞	1 5/32	.80	1.10	1.40
973A	¾	1	1 9/32	1.10	1.50	1.90
974D	...	1⅛	1 13/32	1.25	1.70	2.15
975A	⅞	...	1 19/32	1.35	1.85	2.35
975D	...	1¼	1 17/32	1.35	1.85	2.35
976A	1	...	1 21/32	1.55	2.12	2.70
977A	1⅛	...	1 27/32	1.75	2.40	3.05
978A	1¼	...	2 1/32	2.05	2.85	3.65

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TAPER SHANK TWIST DRILLS

No. 104 Carbon Steel

Diam. Inches	Decimal Equivalent	Price Each Carbon Steel	Price Each High Speed Steel	Length Over-All Inches	Std. Taper Shank
1/16	.0625	$0.45	$0.90	3 7/8	No. 1
5/64	.0781	.45	.90	4 1/8	No. 1
3/32	.0937	.45	.90	4 1/2	No. 1
7/64	.1094	.45	.90	4 3/4	No. 1
1/8	.1250	.45	.90	5 1/8	No. 1
9/64	.1406	.45	.90	5 3/8	No. 1
5/32	.1562	.45	.90	5 5/8	No. 1
11/64	.1719	.50	.90	5 3/4	No. 1
3/16	.1875	.50	.90	5 3/4	No. 1
13/64	.2031	.55	1.00	6	No. 1
7/32	.2187	.55	1.00	6	No. 1
15/64	.2344	.60	1.10	6 1/8	No. 1
1/4	.2500	.60	1.10	6 1/8	No. 1
17/64	.2656	.65	1.20	6 1/4	No. 1
9/32	.2812	.65	1.20	6 1/4	No. 1
19/64	.2969	.70	1.30	6 3/8	No. 1
5/16	.3125	.70	1.30	6 3/8	No. 1
21/64	.3281	.75	1.40	6 1/2	No. 1
11/32	.3437	.75	1.40	6 1/2	No. 1
23/64	.3594	.80	1.50	6 3/4	No. 1
3/8	.3750	.80	1.50	6 3/4	No. 1
25/64	.3906	.90	1.65	7	No. 1
13/32	.4062	.90	1.65	7	No. 1
27/64	.4219	1.00	1.75	7 1/4	No. 1
7/16	.4375	1.00	1.75	7 1/4	No. 1
29/64	.4531	1.10	1.90	7 1/2	No. 1
15/32	.4687	1.10	1.90	7 1/2	No. 1
31/64	.4844	1.20	2.00	7 3/4	No. 1
1/2	.5000	1.20	2.00	7 3/4	No. 1
33/64	.5156	1.30	2.15	8	No. 1
17/32	.5312	1.30	2.15	8	No. 1
35/64	.5469	1.40	2.25	8 1/4	No. 1
9/16	.5625	1.40	2.25	8 1/4	No. 1
37/64	.5781	1.50	2.40	8 1/2	No. 2
19/32	.5937	1.50	2.40	8 1/2	No. 2
39/64	.6094	1.60	2.50	8 3/4	No. 2
5/8	.6250	1.60	2.50	8 3/4	No. 2
41/64	.6406	1.70	2.75	9	No. 2
21/32	.6562	1.70	2.75	9	No. 2
43/64	.6719	1.80	3.00	9 1/4	No. 2
11/16	.6875	1.80	3.00	9 1/4	No. 2
45/64	.7031	1.90	3.25	9 1/2	No. 2
23/32	.7187	1.90	3.25	9 1/2	No. 2
47/64	.7344	2.00	3.50	9 3/4	No. 2
3/4	.7500	2.00	3.50	9 3/4	No. 2
49/64	.7656	2.10	3.75	9 7/8	No. 2
25/32	.7812	2.10	3.75	9 7/8	No. 2
51/64	.7969	2.20	4.00	10	No. 2
13/16	.8125	$2.20	$4.00	10	No. 2
53/64	.8281	2.40	4.40	10 1/4	No. 2
27/32	.8437	2.40	4.40	10 1/4	No. 2
55/64	.8594	2.60	4.75	10 1/2	No. 2
7/8	.8750	2.60	4.75	10 1/2	No. 2
57/64	.8906	2.80	5.15	10 5/8	No. 2
29/32	.9062	2.80	5.15	10 5/8	No. 2
59/64	.9219	3.00	5.50	10 3/4	No. 3
15/16	.9375	3.00	5.50	10 3/4	No. 3
61/64	.9531	3.25	5.90	10 7/8	No. 3
31/32	.9687	3.25	5.90	10 7/8	No. 3
63/64	.9844	3.50	6.25	11	No. 3
1	1.0000	3.50	6.25	11	No. 3
1 1/64	1.0156	3.75	6.75	11 1/8	No. 3
1 1/32	1.0311	3.75	6.75	11 1/8	No. 3
1 3/64	1.0469	4.00	7.25	11 1/4	No. 3
1 1/16	1.0625	4.00	7.25	11 1/4	No. 3
1 5/64	1.0781	4.25	7.75	11 1/2	No. 3
1 3/32	1.0937	4.25	7.75	11 1/2	No. 3
1 7/64	1.1094	4.50	8.25	11 3/4	No. 3
1 1/8	1.1250	4.50	8.25	11 3/4	No. 3
1 9/64	1.1406	4.75	8.90	11 7/8	No. 3
1 5/32	1.1562	4.75	8.90	11 7/8	No. 3
1 11/64	1.1719	5.00	9.50	12	No. 3
1 3/16	1.1875	5.00	9.50	12	No. 3
1 13/64	1.2031	5.25	10.15	12 1/8	No. 3
1 7/32	1.2187	5.25	10.15	12 1/8	No. 3
1 15/64	1.2344	5.50	10.75	12 1/2	No. 3
1 1/4	1.2500	5.50	10.75	12 1/2	No. 3
1 17/64	1.2656	5.75	11.50	14 1/8	No. 4
1 9/32	1.2812	5.75	11.50	14 1/8	No. 4
1 19/64	1.2969	6.00	12.25	14 1/4	No. 4
1 5/16	1.3125	6.00	12.25	14 1/4	No. 4
1 21/64	1.3281	6.25	13.00	14 3/8	No. 4
1 11/32	1.3437	6.25	13.00	14 3/8	No. 4
1 23/64	1.3594	6.50	13.75	14 1/2	No. 4
1 3/8	1.3750	6.50	13.75	14 1/2	No. 4
1 25/64	1.3906	7.00	14.65	14 5/8	No. 4
1 13/32	1.4062	7.00	14.65	14 5/8	No. 4
1 27/64	1.4219	7.50	15.50	14 3/4	No. 4
1 7/16	1.4375	7.50	15.50	14 3/4	No. 4
1 29/64	1.4531	8.00	16.40	14 7/8	No. 4
1 15/32	1.4687	8.00	16.40	14 7/8	No. 4
1 31/64	1.4844	8.50	17.25	15	No. 4
1 1/2	1.5000	8.50	17.25	15	No. 4

Larger sizes furnished.

Standard and Morse Taper the same.
Drills furnished with shanks grooved to fit Grip Sockets without extra charge.
Specify all tools by list numbers.

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TWIST DRILLS

TAPER SQUARE SHANK DRILLS

Fitting Ratchets—No. 1 Shank

No. 104A—Carbon Steel

No. 1 shank ⅝ inch x ⅜ inch x 1½ inches long

Diam. In.	Carbon Steel Each	Length Over All Inches	Length Twist Inches	Diam. In.	Carbon Steel Each	Length Over All Inches	Length Twist Inches
1/8	$0.90	4½	2⅜	27/32	$1.90	7	4¾
5/32	.95	4½	2⅜	7/8	2.05	7½	5¼
3/16	.95	4½	2⅜	29/32	2.20	7½	5¼
7/32	1.00	5	2¾	15/16	2.30	8	5½
1/4	1.00	5	2¾	31/32	2.40	8	5½
9/32	1.05	5	2¾	1	2.55	8½	6¼
5/16	1.10	5	2¾	1 1/32	2.70	8½	6¼
11/32	1.15	5	2¾	1 1/16	2.85	9	6½
3/8	1.20	6	3¾	1 3/32	3.00	9	6½
13/32	1.25	6¼	4	1⅛	3.10	9	6½
7/16	1.25	6¼	4	1 5/32	3.25	9	6½
15/32	1.30	6¼	4	1 3/16	3.35	9	6½
1/2	1.30	6½	4⅜	1 7/32	3.50	9	6½
17/32	1.35	6½	4⅜	1¼	3.65	9	6½
9/16	1.35	6½	4⅜	1 9/32	3.75	9	6½
19/32	1.40	6½	4⅜	1 5/16	3.90	9	6½
5/8	1.40	6½	4⅜	1 11/32	4.05	9	6½
21/32	1.45	6½	4⅜	1⅜	4.20	9	6½
11/16	1.45	6½	4⅜	1 13/32	4.35	9	6½
23/32	1.50	6½	4⅜	1 7/16	4.50	9	6½
3/4	1.55	6½	4⅜	1 15/32	4.65	9	6½
25/32	1.65	6¾	4½	1½	4.80	9	6½
13/16	1.75	7	4¾				

STRAIGHT SHANK—JOBBERS' OR SHORT SERIES

No. 105 Carbon Steel

Diam. Inches	Decimal Equivalent	Carbon Steel Dozen	Length Over All Inches	Length Twist Inches	Diam. Inches	Decimal Equivalent	Carbon Steel Dozen	Length Over All Inches	Length Twist Inches
1/32	.0312	$1.50	1½	⅝	9/32	.2812	$3.80	4¼	2 31/32
*3/64	.0469	1.55	1¾	⅞	*19/64	.2969	4.00	4⅜	3 3/32
1/16	.0625	1.60	2½	1¼	5/16	.3125	4.35	4½	3 3/16
*5/64	.0781	1.65	2⅝	1⅜	*21/64	.3281	4.70	4⅝	3 5/16
3/32	.0937	1.70	2¾	1½	11/32	.3437	5.05	4¾	3 13/32
*7/64	.1094	1.75	2⅞	1⅝	*23/64	.3594	5.50	4⅞	3 17/32
1/8	.1250	1.80	3	1¾	3/8	.3750	6.00	5	3⅝
*9/64	.1406	1.85	3⅛	1⅞	*25/64	.3906	6.50	5⅛	3¾
5/32	.1562	1.90	3¼	2	13/32	.4062	7.00	5¼	3 27/32
*11/64	.1719	2.00	3⅜	2⅛	*27/64	.4219	7.75	5⅜	3 31/32
3/16	.1875	2.25	3½	2¼	7/16	.4375	8.50	5½	4 1/16
*13/64	.2031	2.50	3⅝	2⅜	*29/64	.4531	9.25	5⅝	4 5/16
7/32	.2187	2.75	3¾	2½	15/32	.4687	10.00	5¾	4 9/32
*15/64	.2344	3.00	3⅞	2⅝	*31/64	.4844	11.00	5⅞	4 13/32
1/4	.2500	3.25	4	2¾	1/2	.5000	12.00	6	4½

*Not carried in stock but furnished promptly from factory.

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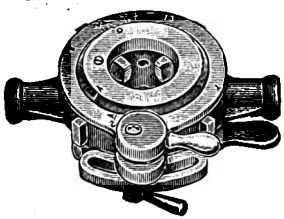
THREADING TOOLS

OSTER DIE STOCKS



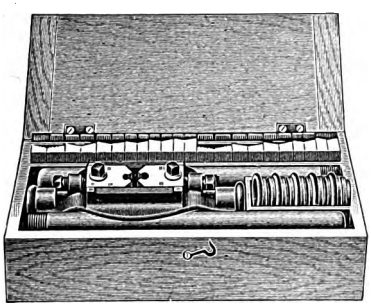
Bulldog

Bulldog die stocks have five big features: 1, self locking, quick opening, adjustable dies; 2, self locking, quick opening, self centering guides; 3, lever control; 4, no loose bushings or breakable small parts; 5, no running back over newly cut threads. Built for perfect lubrication, long service.

Regular Pattern

No.	Pipe Sizes	Per Set	Extra Dies
101	⅛, ¼ & ⅜, ½ & ¾	$13.00	$2.50
103	1 & 1¼, 1½ & 2.....	22.00	3.50

REED STOCKS AND DIES



Armstrong Pattern

This stock will take the No. 2 dies, guides and other parts of all other manufacturers of this type of die. The stocks, handles, screws and all other parts are interchangeable with the same parts for pipe sets. A set consists of a stock complete, with dies, guides and wrench, and each set is packed in a finished hardwood box.

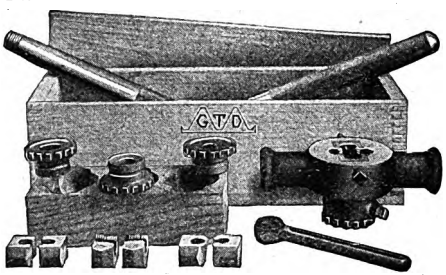
For Pipe

No.	Pipe Sizes	Per Set	Extra Dies Each
2AP1	¼ to 1.....	$12.00	1.50
2AP2	⅛ to 1.....	14.00	1.50

For Bolts

No.	Bolt Sizes	Per Set
2AL2	¼, ⅜, ½, ⅝, ¾, ⅞, 1.....	$20.00
2AL4	½, ⅝, ¾, ⅞, 1, 1⅛, 1¼....	20.00

LITTLE GIANT STOCKS AND DIES

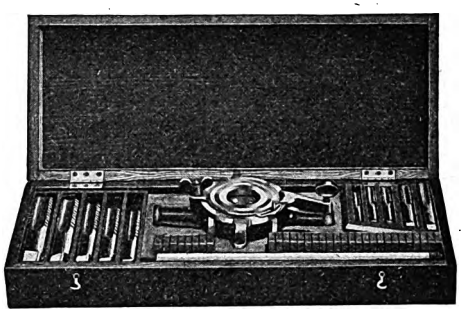


For Pipe

Furnished with one stock, Little Giant pipe dies and bushings in plain wood box. Briggs' standard right hand threads unless otherwise ordered.

No.	Cuttings Sizes	Per Set
260	⅛, ¼, ⅜, ½.....	$9.00
261	¼, ⅜, ½, ¾, 1.....	12.00
261½	½, ¾, 1, 1¼.....	14.00
262	1¼, 1½, 2.....	18.00
262A	1, 1¼, 1½, 2.....	21.00

OSTER SCREW PLATES



With Adjustable Dies and Guides

No. 22, cutting: ¼-20, 5/16-18, ⅜-16, 7/16-14, ½-12, ⅝-11, ¾-10, ⅞-9, 1-8.
Stock with 9 sets of dies, in plain box $23.00
Stock and dies with 9 plug taps, in hardwood case 30.00
Extra dies, right or left, per set (4 pieces) 2.25

No. 28, cutting: ½-12, ⅝-11, ¾-10, ⅞-9, 1-8, 1⅛-7, 1¼-7, 1⅜-6, 1½-6.
Stock with 9 sets of dies, in plain box $35.00
Stock and dies with 9 plug taps, in hardwood case 48.00
Extra dies, right or left, per set (4 pieces) 2.65

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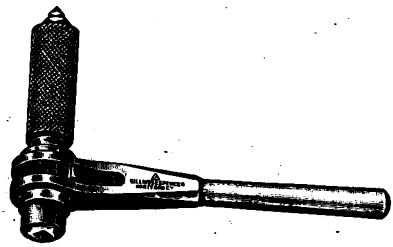
DRILLS

RATCHET DRILLS

Packer's

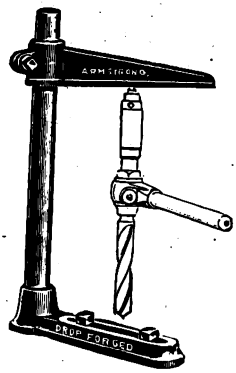


Drop forged steel for square shank drills only.

Nos.	1	2	3	4
Handles, in. ...	10	12	15	17
Height, in.	7¾	8½	9½	10¼
Feed, in.	2¼	2½	3	3½
Each	$10.50	13.50	16.00	19.00

DRILLING POSTS

"Old Man"

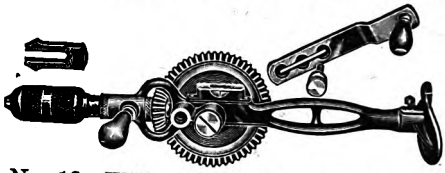


For Use With Ratchet Drill

Foot and arm are drop forged. The finished steel post is screwed into foot and can be easily removed for packing in tool kit.

No.	Height of Post Inches	Daimeter of Post Inches	Arm Radius Inches	Each
8	16	1	8.....	$5.00
10	20	1¼	10.....	6.00
12	26	1½	12.....	7.50

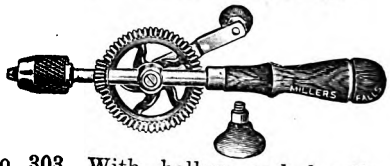
No. 12 IMPROVED BREAST DRILLS



No. 12 With adjustable breast plate, level attachment, ball bearings, extensible crank with radius from 4 to 6 in., changeable speed from even to 3 to 1, chuck holds round shanks ⅛ to ½ in., all sizes bit stock and No. 1 taper shanks. Length 17½ in.

Per dozen .....$...

No. 303 HAND DRILLS



No. 303 With hollow end handle, detachable side handle, three jawed chuck holding round shanks from 0 to $\frac{3}{16}$ in. Length 11¼ in.

Per dozen .....$....

YANKEE DRILLS

No. 41 Automatic

No. 41 Nickel plated, with eight drill points $\frac{1}{16}$ to $\frac{11}{64}$ in., magazine handle for holding drill points, length including drill points 11⅜ in.

Per dozen .....$....

EXTRA DRILL POINTS

For Yankee Drills

Any size .....per doz., $....

Sets of eight.....per set, ...

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STANDARD NAIL CARD

EXTRAS ON STANDARD WIRE NAILS IN KEGS—Effective December 1, 1896

Common Fence, Shingle, Tobacco Flooring and Common Brads

ADVANCES

20d to 60d Base		4d and 5d	$0.30
10d to 16d	$0.05	3d	.45
8d and 9d	.10	2d	.70
6d and 7d	.20	3½d shingle	.40

Barbed Common and Barbed Car Nails

15 cents advance over common.

Casing, Siding and Smooth Box Nails

10d and larger	$0.15
8d and 9d	.25
6d and 7d	.35
4d and 5d	.50
3d	.70
2d	1.00

Barbed Box, 15 cents advance over smooth nails.

Smooth Finishing Nails

10d and larger	$0.25
8d and 9d	.35
6d and 7d	.45
4d and 5d	.65
3d	.85
2d	1.15

Slating Nails

2d	$0.80
3d	.60
4d	.40
5d	.40
6d	.30

Fine Nails

2d, extra fine, 1x17	$1.10
2d, fine	1.00
3d, 1⅛x15	.50
3d, extra fine, 1⅛x16	.65
4d	.50

Barrel Nails

⅝ inch	$1.35	1⅛ inch	$0.60
¾ inch	1.00	1¼ inch	.50
⅞ inch	.85	1⅜ inch	.40
1 inch	.70	1½ inch	.30

Barbed Roofing Nails

¾ inch	$0.75
⅞ inch	.65
1 inch	.60
1⅛ inch	.60
1¼ inch	.55
1½ and 1¾ inch	.45
2 inch	.35

Clinch Nails

(Annealed or Bright)

2d	$1.05
3d	.85
4d and 5d	.65
6d and 7d	.55
8d and 9d	.45
10d to 20d	.35

Hinge Nails

(Annealed or Bright)

4d	$0.80
6d	.70
8d	.60
10d and larger	.50

Boat Nails

25 cents extra over hinge.

Spikes

All sizes to 9 inch	$0.10
10 inch and larger	.25

Special Gauges 10c additional

Barbed Dowel Pins

⅝ inch	$1.25	1⅛ inch	$0.60
¾ inch	1.00	1¼ inch	.60
⅞ inch	.85	1⅜ inch	.60
1 inch	.70	1½ inch	.60

Special Extras on Standard Wire Nails

Annealed Nails (except Clinch and Hinge), 15c per 100 lbs. extra.
Blued Nails, 25c per 100 lbs. extra.
Special Heads, 15c per 100 lbs. extra.
Special Points, 15c per 100 lbs. extra.
Galvanizing All Standard Nails, at special prices.

LIST PRICES OF MISCELLANEOUS WIRE NAILS—Revised February 1, 1910

Per Pound for 1, 5 or 10-lb. Packages. In ordering, state whether flat heads or brad heads are wanted

3/16 inch	
No. 20	$1.80
No. 21	2.00
No. 22	2.20
No. 23	2.40
No. 24	2.55
¼ inch	
No. 19	$1.00
No. 20	1.25
No. 21	1.55
No. 22	1.90
No. 23	2.15
No. 24	2.35
No. 25	2.55
No. 26	3.10
⅜ inch	
No. 18	$0.80
No. 19	.90
No. 20	1.00
No. 21	1.25
No. 22	1.55
No. 23	1.95
No. 24	2.15
No. 25	2.40
No. 26	2.80

½ inch	
No. 14	$0.55
No. 15	.55
No. 16	.55
No. 17	.60
No. 18	.65
No. 19	.75
No. 20	.85
No. 21	1.00
No. 22	1.25
No. 23	1.65
No. 24	1.90
⅝ inch	
No. 12	$0.43
No. 13	.43
No. 14	.43
No. 15	.45
No. 16	.50
No. 17	.52
No. 18	.58
No. 19	.65
No. 20	.75
No. 21	.85
No. 22	1.10
No. 23	1.45
No. 24	1.65

¾ inch	
No. 10	$0.36
No. 11	.36
No. 12	.36
No. 13	.38
No. 14	.38
No. 15	.42
No. 16	.43
No. 17	.46
No. 18	.52
No. 19	.60
No. 20	.70
No. 21	.85
⅞ inch	
No. 8	$0.33
No. 9	.33
No. 10	.33
No. 11	.33
No. 12	.33
No. 13	.34
No. 14	.35
No. 15	.36
No. 16	.39
No. 17	.43
No. 18	.45
No. 19	.56
No. 20	.67

1 inch	
Nos. 7-12	$0.30
No. 13	.31
No. 14	.32
No. 15	.33
No. 16	.36
No. 17	.40
No. 18	.43
No. 19	.53
No. 20	.64
1⅛ inch	
Nos. 7-12	$0.30
No. 13	.32
No. 14	.32
No. 15	.32
No. 16	.35
No. 17	.40
No. 18	.43
No. 19	.53
1¼ & 1⅜ inch	
Nos. 6-12	$0.29
No. 13	.30
No. 14	.31
No. 15	.32
No. 16	.34
No. 17	.39
1½ & 1⅝ inch	
Nos. 4-13	$0.29
No. 14	.30
No. 15	.31
No. 16	.33
No. 17	.38
1¾ inch	
Nos. 4-13	$0.28
No. 14	.29
No. 15	.30
No. 16	.32
No. 17	.38
2 inch	
Nos. 3-10	$0.27
No. 11	.28
No. 12	.28
No. 13	.28
No. 14	.29
No. 15	.30
No. 16	.35
2¼ inch	
Nos. 3-10	$0.27
No. 11	.28
No. 12	.28
No. 13	.28
No. 14	.29

2½ inch	
Nos. 3-10	$0.26
No. 11	.27
No. 12	.27
No. 13	.28
2¾ inch	
Nos. 3-10	$0.26
No. 11	.27
No. 12	.27
3 inch	
Nos. 3-10	$0.25
No. 11	.26
No. 12	.27
3¼ inch	
Nos. 3-10	$0.25
No. 11	.26
No. 12	.27
3½ inch	
Nos. 3-10	$0.25
No. 11	.26
4 inch	
Nos. 3-10	$0.25
No. 11	.26

List of Extras and Deductions From List on Miscellaneous Nails. Subject to Discount

Add to list 4c per lb. for ½ lb. paper boxes.
Add to list 8c per lb. for ¼ lb. paper boxes.
Add to list 2c per lb. for barbing.
Add to list 2c per lb. for annealing.
Add to list 2c for Special Heads or Headless.
Add to list 2c for Needle or any Special points.
For lengths not listed, use list price for same gauge in nearest shorter length.
Deduction for 25 and 50 lb. boxes, 1 cent per lb.

For Nails finer than full gauge, apply list price of same length in next finer gauge. For example, for No. 18½ gauge use No. 19 list, etc.
Nails heavier than listed, at special net prices, according to quantity.
Galvanizing, tinning, brass plating, coppering, bluing and annealing miscellaneous nails, at special prices.
Deduction for 100 lb. kegs, 2 cents per lb.

Galvanized Nails of All Kinds Carried in Stock

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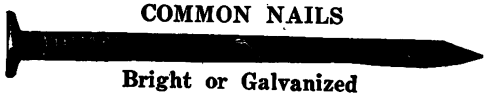
NAILS

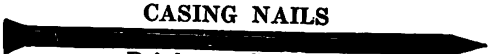
COMMON NAILS



Bright or Galvanized

Size	Length Inches	Gauge No.	Approx. No. to Lb.	Advance Over Base Price
2d	1	15	876	$0.70
3d	1¼	14	568	.45
4d	1½	12½	316	.30
5d	1¾	12½	271	.30
6d	2	11½	181	.20
7d	2¼	11½	161	.20
8d	2½	10¼	106	.10
9d	2¾	10¼	96	.10
10d	3	9	69	.05
12d	3¼	9	63	.05
16d	3½	8	49	.05
20d	4	6	31	Base
30d	4½	5	24	Base
40d	5	4	18	Base
50d	5½	3	14	Base
60d	6	2	11	Base

CASING NAILS



Bright or Galvanized

Size	Length Inches	Gauge No.	Approx. No. to Lb.	Advance Over Base Price
2d	1	15½	1010	$1.00
3d	1¼	14½	635	.70
4d	1½	14	473	.50
5d	1¾	14	406	.50
6d	2	12½	236	.35
7d	2¼	12½	210	.35
8d	2½	11½	145	.25
9d	2¾	11½	132	.25
10d	3	10½	94	.15
12d	3¼	10½	87	.15
16d	3½	10	71	.15
20d	4	9	52	.15
30d	4½	9	46	.15
40d	5	8	35	.15

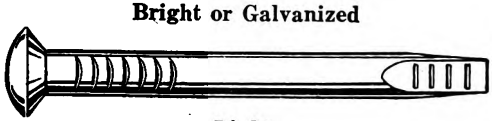
FINISHING NAILS

Bright or Galvanized

Size	Length Inches	Gauge No.	Approx. No. to Lb.	Advance Over Base Price
2d	1	16½	1351	$1.15
3d	1¼	15½	807	.85
4d	1½	15	584	.65
5d	1¾	15	500	.65
6d	2	13½	309	.45
7d	2¼	13	238	.45
8d	2½	12½	189	.35
9d	2¾	12½	172	.35
10d	3	11½	121	.25
12d	3¼	11½	113	.25
16d	3½	11	90	.25
20d	4	10	62	.25

BOAT NAILS

Bright or Galvanized



Light

Size	Length Inches	Gauge No.	Approx. No. to Lb.	Advance Over Base Price
4d	1½	3/16	82	$1.05
6d	2	3/16	62	.95
8d	2½	3/16	50	.85
10d	3	⅜	22	.75
12d	3¼	¼	20	.75
16d	3½	¼	18	.75
20d	4	¼	16	.75

Heavy

Size	Length Inches	Gauge No.	Approx. No. to Lb.	Advance Over Base Price
4d	1½	¼	44	$1.05
6d	2	¼	32	.95
8d	2½	¼	26	.85
10d	3	⅜	14	.75
12d	3¼	⅜	13	.75
16d	3½	⅜	12	.75
20d	4	⅜	10	.75

Barbed nails furnished in all sizes and styles at 15c per 100 lbs. over smooth.

CLINCH NAILS

Bright or Galvanized

Size	Length Inches	Gauge No.	Approx. No. to Lb.	Advance Over Base Price
2d	1	14	710	$1.05
3d	1¼	13	429	.85
4d	1½	12	274	.65
5d	1¾	12	235	.65
6d	2	11	157	.55
7d	2¼	11	139	.55
8d	2½	10	99	.45
9d	2¾	10	90	.45
10d	3	9	69	.35
12d	3¼	9	62	.35
16d	3½	8	49	.35
20d	4	7	37	.35

Galvanized Nails of All Kinds Carried in Stock

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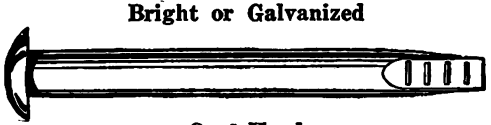
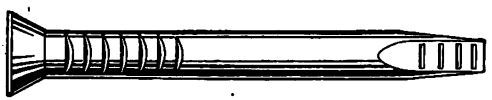
NAILS AND SPIKES

HINGE NAILS

Bright or Galvanized



Oval Head



Countersunk Head

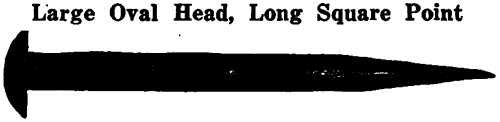
Heavy

Size	Length Inches	Gauge Inch	Approx. No. to Lb.	Extra Over Base Price
4d	1½	¼	50	$0.80
6d	2	¼	38	.70
8d	2½	¼	30	.60
10d	3	⅜	12	.50
12d	3¼	⅜	11	.50
16d	3½	⅜	10	.50
20d	4	⅜	9	.50

Light

Size	Length Inches	Gauge Inch	Approx. No. to Lb.	Extra Over Base Price
4d	1½	3/16	82	$0.80
6d	2	3/16	62	.70
8d	2½	3/16	50	.60
10d	3	¼	25	.50
12d	3¼	¼	23	.50
16d	3½	¼	22	.50
20d	4	¼	19	.50

Large Oval Head, Long Square Point



Sometimes called Truss head nails.

3/16x1½, 1¾, 2, 2½, 2¾, 3 in...per lb., $....

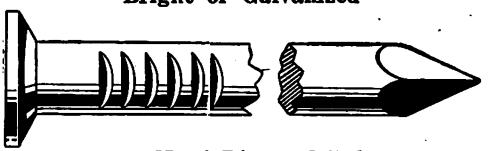
¼x1½, 1¾, 2, 2½, 2¾, 3 in...per lb., ...

Approximate Number to Pound

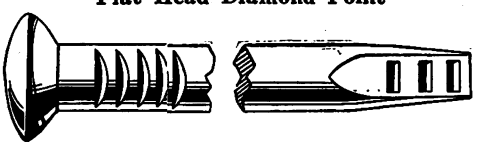
Inch	3/16 In.	¼ In.
1½	81	47
1¾	68	41
2	61	33
2¼	54	31
2½	48	28
2¾	45	26
3	41	24

WIRE SPIKES

Bright or Galvanized



Flat Head Diamond Point

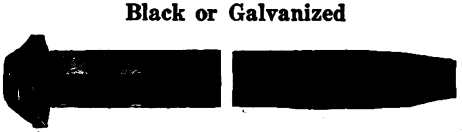


Oval Head Chisel Point

Size	Length Inches	Gauge No.	Approx. No. to Lb.	Extra Over Base Price
10d	3	6	41	$0.10
12d	3¼	6	38	.10
16d	3½	5	36	.10
20d	4	4	23	.10
30d	4½	3	17	.10
40d	5	2	13	.10
50d	5½	1	10	.10
60d	6	1	9	.10
		Inch		
7d	7	5/16	7	.10
8d	8	⅜	4	.10
9d	9	⅜	3½	.10
10d	10	⅜	3	.25
12d	12	⅜	2½	.25

BOAT OR SHIP SPIKES

Black or Galvanized



In kegs of 200 lbs. Prices on application.

Approximate Number of Boat Spikes to a Keg of 200 Pounds

Length, in..	3	4	5	6	7	8
Sq. Inch						
⅝	....	....	....	....	....	260
½	....	....	....	450	375	335
7/16	....	....	....	600	590	510
⅜	1320	1140	940	800	650	600
5/16	1660	1360	1230	1175	990	880
¼	3000	2375	2050	1825	....	....
Length, in..	9	10	11	12	14	16
Sq. Inch						
⅝	240	220	205	190	175	160
½	300	275	260	240	....	....
7/16	400	360	320	230	....	....
⅜	525	475	....	....	....	....

Galvanized Nails of All Kinds Carried in Stock

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NAILS, BRADS AND TACKS

BOAT NAILS

Hot Galvanized with Pure Zinc, Free From Lumps

Round Head, Blunt Point

Length in....	¾	⅞	1	1⅛	1¼
Per lb.....	$0.10	.09	.08½	.08¼	.08
Length, in..	1½	1¾	2	2¼ to 6 in.	
Per lb....	$0.07¾	.07¾	.07½	.07¼	

Countersunk Head, Blunt Point

Length in....	¾	⅞	1	1⅛	1¼
Per lb.....	$0.18	.15	.13	.13	.12
Length, in..	1½	1¾	2	2¼ to 6 in.	
Per lb....	$0.12	.12	.12	.11½	

Round Head, Chisel Point

Length, in....	¾	⅞	1	1⅛	1¼	1½
Per lb.	$0.23	.20	.18	.17	.17	.16
Length, in....	1¾	2	2¼	2½	2¾	3
Per lb.	$0.16	.15	.15	.15	.15	.15
Length, in.	3¼	3½	3¾	4		
Per lb.	$0.14	.14	.13½	.13½		

CUT NAILS

Galvanized, tinned and copper. For boat work, etc.

Price per Pound

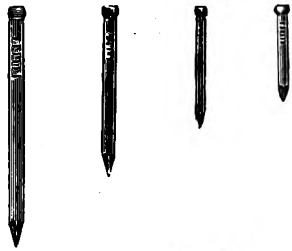
Lgth, in.	¾	⅞	1	1¼	1½	1¾	2
Copper .	$0.60	.60	.55	.55	.55	.55	.55
Galv. ...	.40	.40	.35	.35	.35	.35	.35
Tinned ..	.30	.30	.25	.25	.25	.25	.25
Lgth, in.	2¼	2½	2¾	3	3¼	3½	6
Copper .	$0.55	.55	.55	.55	.55	.55	.55
Galv. ...	.35	.35	.35	.35	.35	.35	.35
Tinned ..	.25	.25	.25	.25	.25	.25	.25

COPPER WIRE NAILS

In 5 lb. papers and 50 lb. boxes. Made of special wire.

Length, in....	½	⅝	¾	⅞	1	1¼	1½	1¾
Per lb.	$0.50	.45	.40	.40	.35	.35	.35	.35
Length in.....	2	2¼	2½	2¾	3	3¼	3½ to 6	
Per lb.	$0.35	.35	.35	.35	.35	.35	.35	

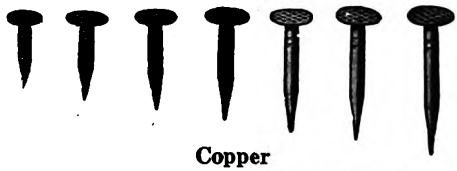
WIRE BRADS



Bright or Galvanized

Length, in....	½	½	½	⅝	⅝	⅝	¾	¾
Gauge Nos. ...	18	19	20	18	19	20	17	18
Per lb.	$0.65	.75	.85	.58	.65	.75	.46	.52
Length, in....	¾	⅞	⅞	⅞	⅞	1	1	1
Gauge Nos. ...	19	16	17	18	19	15	16	17
Per lb.	$0.60	.39	.43	.35	.56	.33	.36	.40

WIRE TACKS



Copper

One pound boxes, 1 cent per lb. advance for ½ lb. boxes.

Lgth., in.....	⅜	7/16	½	⅝	¾	⅞
Size, oz.	3	4	6	10	14	18
Per lb.	$0.70	.60	.56	.56	.56	.56
Lgth, in.	1	1⅛	1¼	1½	1¾	2
Size, oz.	22	24	26	30	34	40
Per lb.	$0.56	.56	.56	.56	.56	.56

Bright Steel

Lgth, in.	½	⅝	¾	⅞	1	1⅛
Per lb.	$0.30	.25	.25	.25	.25	.25

Galvanized

Lgth, in.	½	⅝	¾	⅞	1	1⅛
Per lb.	$0.30	.25	.25	.25	.25	.25

Galvanized Nails of All Kinds Carried in Stock

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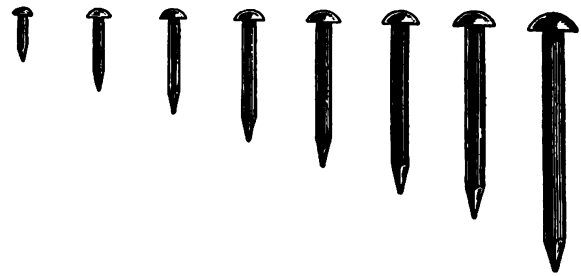
ESCUTCHEON PINS



BRASS—In 1 Pound Paper Boxes

Per Pound

Stubs Wire Gauge	Length in Inches												
	3/16	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4	2
10	....	....	$0.75	$0.73	$0.72	$0.71	$0.70	$0.69	$0.68	$0.67	$0.66	$0.65	$0.65
11	....	....	.76	.74	.73	.72	.71	.70	.69	.68	.67	.66	.66
12	....	....	.77	.75	.74	.73	.72	.71	.70	.69	.68	.67	.67
13	....	....	.78	.76	.75	.74	.73	.72	.71	.70	.69	.69	.69
14	$0.90	$0.83	.80	.77	.76	.75	.74	.73	.72	.71	.70	.70	.70
15	.95	.85	.82	.78	.77	.76	.75	.74	.73	.72	.72	.72	.72
16	1.00	.90	.85	.82	.80	.78	.76	.75	.74	.74	.74	.74	.75
17	1.10	1.00	.92	.89	.87	.85	.83	.81	.80	.80	.80	.81	.82
18	1.20	1.10	1.00	.96	.94	.92	.90	.90	.90	.92	.92	.93	.95
19	1.35	1.20	1.15	1.10	1.05	1.00	1.00	1.03	1.03	1.03	1.05	....	....
20	1.55	1.35	1.25	1.20	1.15	1.10	1.10	1.15	1.15	1.15	....	....	....
21	1.75	1.55	1.45	1.35	1.30	1.30	1.35	1.35	....	....	....	....	....
22	2.00	1.75	1.60	1.45	1.40	1.45	....	....	....	....	....	....	....

STEEL—In 1 Pound Paper Boxes

Per Pound

Stubs Wire Gauge	Length in Inches												
	3/16	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4	2
10	....	....	$0.29	$0.26	$0.24	$0.23	$0.22	$0.21	$0.20	$0.19	$0.17	$0.17	$0.16
11	....	....	.29	.26	.24	.23	.22	.21	.20	.19	.17	.17	.16
12	....	....	.32	.28	.26	.24	.23	.22	.21	.19	.18	.17	.17
13	....	....	.34	.30	.28	.26	.24	.23	.22	.20	.19	.19	.19
14	....	....	.37	.33	.30	.27	.24	.23	.23	.21	.20	.20	.20
15	....	$0.44	.40	.36	.32	.28	.25	.24	.24	.23	.22	.22	.22
16	....	.47	.42	.37	.33	.29	.26	.25	.25	.24	.24	.24	.24
17	....	.49	.44	.39	.35	.31	.28	.27	.27	.26	.26	.26	.26
18	....	.52	.47	.42	.37	.33	.30	.29	.29	.28	.28	.28	.28
19	....	.62	.52	.47	.42	.37	.35	.35	.35	.35	.35	....	....
20	$1.02	.82	.67	.57	.47	.42	.42	.42	.42	.42	....	....	....
21	1.22	1.02	.87	.77	.62	.57	.57	.57	....	....	....	....	....
22	1.32	1.12	.97	.87	.72	.72	....	....	....	....	....	....	....

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IRON WOOD SCREWS

Hot Galvanized and Sherardized

The thread and slot in our galvanized screws are left clean and perfect.

Flat or Round Head

No.	Per Gross
¼ Inch	
0	$0.72
1	.72
2	.72
3	.72
4	.72
⅜ Inch	
0	$0.72
1	.72
2	.72
3	.72
4	.72
5	.75
6	.78
7	.82
8	.88
9	.94
½ Inch	
1	$0.72
2	.72
3	.72
4	.75
5	.78
6	.80
7	.84
8	.90
9	.96
10	1.05
11	1.10
12	1.20
⅝ Inch	
1	$0.72
2	.72
3	.72
4	.75
5	.78
6	.82
7	.86
8	.92
9	.98
10	1.07
11	1.12
12	1.20
13	1.25
14	1.30
¾ Inch	
2	$0.72
3	.75
4	.78
5	.82
6	.85
7	.90
8	.95
9	1.00
10	1.10
11	1.15
12	1.25
13	1.35
14	1.50
15	1.65
16	1.80

No.	Per Gross
⅞ Inch	
2	$0.74
3	.78
4	.82
5	.85
6	.90
7	.94
8	1.00
9	1.05
10	1.15
11	1.25
12	1.35
13	1.45
14	1.55
15	1.75
16	2.00
1 Inch	
3	$0.80
4	.84
5	.87
6	.92
7	.98
8	1.05
9	1.10
10	1.20
11	1.30
12	1.40
13	1.60
14	1.70
15	2.00
16	2.50
17	2.70
18	2.80
20	3.50
1¼ Inch	
3	$0.88
4	.92
5	.98
6	1.05
7	1.10
8	1.15
9	1.20
10	1.30
11	1.40
12	1.55
13	1.70
14	1.90
15	2.15
16	2.50
17	2.75
18	3.30
20	4.00
22	4.80
24	5.40
1½ Inch	
3	$0.98
4	1.05
5	1.10
6	1.15
7	1.20
8	1.30
9	1.35
10	1.40
11	1.50

No.	Per Gross
12	$1.65
13	1.80
14	2.00
15	2.35
16	2.80
17	3.20
18	3.80
20	4.30
22	5.10
24	5.90
1¾ Inch	
5	$1.30
6	1.35
7	1.45
8	1.50
9	1.55
10	1.60
11	1.70
12	1.80
13	2.00
14	2.25
15	2.60
16	2.90
17	3.50
18	4.00
20	4.50
22	5.20
24	6.00
2 Inch	
5	$1.45
6	1.50
7	1.55
8	1.60
9	1.65
10	1.75
11	1.85
12	2.00
13	2.20
14	2.45
15	2.75
16	3.10
17	3.70
18	4.20
20	4.80
22	5.50
24	6.40
2¼ Inch	
5	$1.55
6	1.60
7	1.65
8	1.75
9	1.85
10	1.95
11	2.05
12	2.20
13	2.35
14	2.65
15	3.10
16	3.50
17	3.85
18	4.55
20	5.30
22	6.10
24	6.90

No	Per Gross
2½ Inch	
5	$1.90
6	2.00
7	2.10
8	2.20
9	2.30
10	2.40
11	2.50
12	2.60
13	2.70
14	2.90
15	3.30
16	3.65
17	4.20
18	4.70
20	5.80
22	6.70
24	7.50
2¾ Inch	
6	$2.40
7	2.60
8	2.70
9	2.80
10	2.90
11	3.00
12	3.10
13	3.20
14	3.30
15	3.60
16	3.90
17	4.50
18	5.00
20	6.10
22	7.20
24	8.50
3 Inch	
6	$2.95
7	3.00
8	3.05
9	3.10
10	3.15
11	3.20
12	3.30
13	3.40
14	3.50
15	3.80
16	4.20
17	4.80
18	5.50
20	6.50
22	7.50
24	8.70
26	10.50
3½ Inch	
8	$3.90
9	4.00
10	4.10
11	4.20
12	4.30
13	4.40
14	4.50
15	4.75
16	4.95
17	5.40
18	6.15

No.	Per Gross
20	$7.30
22	8.70
24	10.20
26	12.00
4 Inch	
8	$4.90
9	5.10
10	5.20
11	5.30
12	5.40
13	5.60
14	5.90
15	6.20
16	6.50
17	7.00
18	7.60
20	8.60
22	9.70
24	11.20
26	14.00
28	16.00
30	18.50
4½ Inch	
12	$7.00
13	7.20
14	7.60
15	7.85
16	8.15
17	8.60
18	9.15
20	9.85
22	11.20
24	13.50
26	16.00
28	18.50
30	21.50
5 Inch	
12	$8.10
13	8.30
14	8.60
15	9.10
16	9.70
17	10.10
18	11.00
20	11.50
22	13.00
24	15.00
26	18.00
28	21.00
30	24.00
6 Inch	
12	$10.00
13	10.30
14	11.00
15	11.60
16	12.40
17	13.00
18	14.50
20	16.00
22	18.00
24	20.00
26	23.00
28	27.00
30	30.50

Flat head and oval head countersunk wood screws are measured from outer edge of countersink to point.

Galvanized Screws of All Kinds Carried in Stock

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BRASS WOOD SCREWS

Flat or Round Head

No.	Per Gross
¼ Inch	
0	$0.84
1	.84
2	.88
3	.92
4	.97
5	1.04
⅜ Inch	
0	$0.84
1	.87
2	.92
3	.97
4	1.04
5	1.12
6	1.20
7	1.35
8	1.50
½ Inch	
1	$0.92
2	.96
3	1.02
4	1.08
5	1.20
6	1.30
7	1.45
8	1.65
9	1.90
10	2.15
⅝ Inch	
1	$0.96
2	1.00
3	1.08
4	1.15
5	1.30
6	1.40
7	1.60
8	1.85
9	2.10
10	2.40
11	2.65
12	3.00
13	3.35
14	3.70
15	4.10
16	4.55
¾ Inch	
2	$1.12
3	1.18
4	1.25
5	1.40
6	1.55
7	1.75
8	2.00
9	2.30
10	2.65
11	3.00
12	3.35
13	$3.70
14	4.10
15	4.55
16	5.05
⅞ Inch	
2	$1.40
3	1.50
4	1.55
5	1.60
6	1.65
7	1.90
8	2.20
9	2.50
10	2.90
11	3.35
12	3.70
13	4.10
14	4.55
15	5.05
16	5.60
1 Inch	
3	$1.65
4	1.70
5	1.75
6	1.80
7	2.10
8	2.45
9	2.80
10	3.15
11	3.65
12	4.10
13	4.55
14	5.05
15	5.60
16	6.65
18	7.40
1¼ Inch	
3	$2.10
4	2.20
5	2.25
6	2.35
7	2.45
8	2.85
9	3.20
10	3.50
11	4.10
12	4.65
13	5.35
14	5.85
15	6.55
16	7.20
17	7.85
18	9.35
20	10.45
1½ Inch	
4	$2.95
5	3.05
6	$3.10
7	3.20
8	3.30
9	3.65
10	4.25
11	4.65
12	5.35
13	5.95
14	6.65
15	7.60
16	8.35
17	9.15
18	10.85
20	12.65
22	14.50
1¾ Inch	
6	$3.95
7	4.00
8	4.10
9	4.20
10	4.70
11	5.35
12	6.05
13	6.70
14	7.35
15	8.65
16	9.50
17	10.45
18	12.40
20	14.50
22	16.85
24	18.90
2 Inch	
6	$5.15
7	5.20
8	5.25
9	5.30
10	5.40
11	6.15
12	6.85
13	7.55
14	8.45
15	9.75
16	10.70
17	11.70
18	13.90
20	16.30
22	18.90
24	21.00
2¼ Inch	
8	$6.85
9	6.95
10	7.05
11	7.25
12	7.90
13	8.80
14	9.80
15	10.75
16	$11.90
17	13.00
18	15.40
20	18.00
22	20.95
24	23.30
2½ Inch	
9	$9.40
10	9.50
11	9.60
12	9.70
13	9.85
14	10.75
15	11.85
16	13.00
17	14.30
18	16.95
20	19.85
22	23.00
24	25.50
2¾ Inch	
9	$11.50
10	11.65
11	11.80
12	11.95
13	12.10
14	12.25
15	13.00
16	14.20
17	15.65
18	18.40
20	21.60
22	25.00
24	28.00
3 Inch	
10	$13.70
11	13.85
12	14.00
13	14.10
14	14.30
15	14.60
16	15.40
17	16.80
18	19.95
20	23.40
22	27.10
24	31.15
26	35.85
28	41.15
30	47.45
3½ Inch	
10	$15.85
11	16.00
12	16.15
13	16.30
14	16.45
15	$16.60
16	17.70
17	19.40
18	22.75
20	26.90
22	31.20
24	35.80
26	41.20
28	47.45
30	54.55
4 Inch	
12	$18.60
13	18.80
14	19.00
15	19.25
16	20.35
17	22.30
18	26.90
20	30.80
22	36.00
24	40.70
26	47.35
28	54.55
30	62.70
4½ Inch	
14	$22.60
15	22.80
16	23.40
17	25.75
18	30.90
20	35.40
22	41.40
24	46.80
26	54.40
28	62.70
30	72.15
5 Inch	
16	$26.90
17	29.60
18	35.50
20	40.70
22	47.60
24	53.80
26	62.60
28	72.15
30	82.95
6 Inch	
16	$31.00
17	34.05
18	40.80
20	46.80
22	54.75
24	61.90
26	72.95
28	82.95
30	93.35

Flat head and oval head countersunk wood screws are measured from outer edge of countersink to point.

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COACH OR LAG SCREWS

BLACK OR HOT GALVANIZED, SQUARE HEAD

Standard List of November 12, 1908. Price per Hundred

Length Inches	Size, Inches ¼ & 5/16	3/8	7/16	½	9/16 & ⅝	¾	⅞	1
1½	$2.25	$2.70	$3.15	$3.75	....	....	....	....
2	2.45	2.96	3.47	4.11	$6.00	....	....	....
2½	2.65	3.22	3.79	4.47	6.50	$9.20	....	....
3	2.85	3.48	4.11	4.83	7.00	9.90	$15.00	....
3½	3.05	3.74	4.43	5.19	7.50	10.60	16.00	$22.00
4	3.25	4.00	4.75	5.55	8.00	11.30	17.00	23.30
4½	3.45	4.26	5.07	5.91	8.50	12.00	18.00	24.60
5	3.65	4.52	5.39	6.27	9.00	12.70	19.00	25.90
5½	3.85	4.78	5.71	6:63	9.50	13.40	20.00	27.20
6	4.05	5.04	6.03	6.99	10.00	14.10	21.00	28.50
6½	...	...	6.35	7.35	10.50	14.80	22.00	29.80
7	...	...	6.67	7.71	11.00	15.50	23.00	31.10
7½	...	...	6.99	8.07	11.50	16.20	24.00	32.40
8	...	...	7.31	8.43	12.00	16.90	25.00	33.70
9	...	...	7.95	9.15	13.00	18.30	27.00	36.30
10	...	...	...	9.87	14.00	19.70	29.00	38.90
11	...	...	...	10.59	15.00	21.10	31.00	41.50
12	...	...	...	11.31	16.00	22.50	33.00	44.10

Lag screws with hexagon head 10% extra.

CAST MANGANESE BRONZE WITH CUT THREADS

Price per Hundred

Length Inches	Size, Inches ¼ 5/16, ⅜	7/16	½	⅝	¾
1½	$5.83	$7.50	$8.33	$14.58	$22.92
2	6.25	8.33	10.00	18.75	29.17
2½	6.67	9.58	12.92	22.08	32.50
3	7.92	12.08	14.17	25.83	37.00
3½	8.75	12.92	17.08	28.33	40.00
4	9.58	14.17	19.58	30.42	44.58
4½	11.25	15.83	22.08	33.33	48.33
5	12.50	17.50	23.75	38.33	51.68
5½	13.75	20.00	27.50	42.92	59.58
6	13.75	20.00	27.50	42.92	59.58
7	....	22.92	30.00	47.08	67.92
8	....	....	34.92	55.42	75.00
9	....	....	38.33	56.67	89.17
10	....	....	43.75	66.25	112.50

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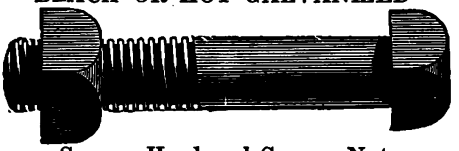
MACHINE BOLTS

BLACK OR HOT GALVANIZED



Square Head and Square Nut

The thread is left clean and perfectly coated.

Standard List. In effect August 1, 1912. Price per Hundred.

Length Inches	Size, Inches ¼	5/16	⅜	7/16	½	9/16-⅝	¾	⅞	1	1⅛	1¼
1½	$1.70	$2.00	$2.40	$2.80	$3.60	$5.20	$7.70	$10.50	$15.10	$22.50	$30.00
2	1.78	2.12	2.56	3.00	3.86	5.58	8.25	11.20	16.00	23.70	31.50
2½	1.86	2.24	2.72	3.20	4.12	5.96	8.80	11.90	16.90	24.90	33.00
3	1.94	2.36	2.88	3.40	4.38	6.34	9.35	12.60	17.80	26.10	34.50
3½	2.02	2.48	3.04	3.60	4.64	6.72	9.90	13.30	18.70	27.30	36.00
4	2.10	2.60	3.20	3.80	4.90	7.10	10.45	14.00	19.60	28.50	37.50
4½	2.18	2.72	3.36	4.00	5.16	7.48	11.00	14.70	20.50	29.70	39.00
5	2.26	2.84	3.52	4.20	5.42	7.86	11.55	15.40	21.40	30.90	40.50
5½	2.34	2.96	3.68	4.40	5.68	8.24	12.10	16.10	22.30	32.10	42.00
6	2.42	3.08	3.84	4.60	5.94	8.62	12.65	16.80	23.20	33.30	43.50
6½	2.50	3.20	4.00	4.80	6.20	9.00	13.20	17.50	24.10	34.50	45.00
7	2.58	3.32	4.16	5.00	6.46	9.38	13.75	18.20	25.00	35.70	46.50
7½	2.66	3.44	4.32	5.20	6.72	9.76	14.30	18.90	25.90	36.90	48.00
8	2.74	3.56	4.48	5.40	6.98	10.14	14.85	19.60	26.80	38.10	49.50
9	2.90	3.80	4.80	5.80	7.50	10.90	15.95	21.00	28.60	40.50	52.50
10	3.06	4.04	5.12	6.20	8.02	11.66	17.05	22.40	30.40	42.90	55.50
11	3.22	4.28	5.44	6.60	8.54	12.42	18.15	23.80	32.20	45.30	58.50
12	3.38	4.52	5.76	7.00	9.06	13.18	19.25	25.20	34.00	47.70	61.50
13	3.54	4.76	6.08	7.40	9.58	13.94	20.35	26.60	35.80	50.10	64.50
14	3.70	5.00	6.40	7.80	10.10	14.70	21.45	28.00	37.60	52.50	67.50
15	3.86	5.24	6.72	8.20	10.62	15.46	22.55	29.40	39.40	54.90	70.50
16	4.02	5.48	7.04	8.60	11.14	16.22	23.65	30.80	41.20	57.30	73.50
17	4.18	5.72	7.36	9.00	11.66	16.98	24.75	32.20	43.00	59.70	76.50
18	4.34	5.96	7.68	9.40	12.18	17.74	25.85	33.60	44.80	62.10	79.50
19	4.50	6.20	8.00	9.80	12.70	18.50	26.95	35.00	46.60	64.50	82.50
20	4.66	6.44	8.32	10.20	13.22	19.26	28.05	36.40	48.40	66.90	85.50

For hexagon head or hexagon nut add 10%. For both add 20%.

BRONZE

Hexagon Head and Nut

Price per Hundred

Length Inches	Size, Inches ¼	5/16	⅜	7/16	½	⅝	¾
2	$4.60	$5.85	$10.40	$14.60	$18.75	$....	$....
2½	5.45	6.70	11.70	16.70	22.95	....	....
3	5.85	7.95	13.35	18.35	25.00	36.25	57.10
3½	6.25	8.75	14.20	19.60	27.90	....	....
4	7.10	9.60	15.85	21.70	30.45	42.90	64.60
4½	7.50	10.45	16.70	22.50	31.70	45.85	72.50
5	7.95	11.70	18.35	25.40	33.75	46.70	76.70
5½	8.75	12.10	19.60	26.25	35.40	47.50	79.20
6	9.60	12.95	22.10	27.50	37.10	58.35	83.35
6½	...	....	22.50	28.75	40.00	59.20	....
7	...	....	22.95	....	41.25	65.85	....
8	...	....	26.25	....	47.10	70.00	....

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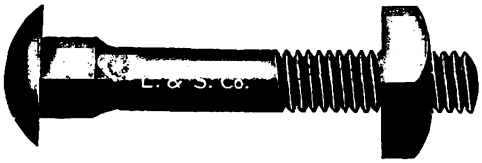
BOLTS



COMMON CARRIAGE BOLTS

Black or Hot Galvanized

Standard List. Adopted November 1, 1912

Price per Hundred

Length Inches	Size, Inches						
	3/16 & 1/4	5/16	3/8	7/16	1/2	9/16 & 5/8	3/4
1½	$1.00	$1.40	$1.90	$2.20	....	....	....
2	1.10	1.52	2.06	2.40	....	....	....
2½	1.20	1.64	2.22	2.60	$3.25	$5.75	$8.50
3	1.30	1.76	2.38	2.80	3.53	6.13	9.00
3½	1.40	1.88	2.54	3.00	3.81	6.51	9.50
4	1.50	2.00	2.70	3.20	4.09	6.89	10.00
4½	1.60	2.12	2.86	3.40	4.37	7.27	10.50
5	1.70	2.24	3.02	3.60	4.65	7.65	11.00
5½	1.80	2.36	3.18	3.80	4.93	8.03	11.50
6	1.90	2.48	3.34	4.00	5.21	8.41	12.00
6½	2.00	2.60	3.50	4.20	5.49	8.79	12.50
7	2.10	2.72	3.66	4.40	5.77	9.17	13.00
7½	2.20	2.84	3.82	4.60	6.05	9.55	13.50
8	2.30	2.96	3.98	4.80	6.33	9.93	14.00
8½	2.40	3.08	4.14	5.00	6.61	10.31	14.50
9	2.50	3.20	4.30	5.20	6.89	10.69	15.00
9½	2.60	3.32	4.46	5.40	7.17	11.07	15.50
10	2.70	3.44	4.62	5.60	7.45	11.45	16.00
11	2.90	3.68	4.94	6.00	8.01	12.21	17.00
12	3.10	3.92	5.26	6.40	8.57	12.97	18.00
13	3.30	4.16	5.58	6.80	9.13	13.73	19.00
14	3.50	4.40	5.90	7.20	9.69	14.49	20.00
15	3.70	4.64	6.22	7.60	10.25	15.25	21.00
16	3.90	4.88	6.54	8.00	10.81	16.01	22.00
17	4.10	5.12	6.86	8.40	11.37	16.77	23.00
18	4.30	5.36	7.18	8.80	11.93	17.53	24.00
19	4.50	5.60	7.50	9.20	12.49	18.29	25.00
20	4.70	5.84	7.82	9.60	13.05	19.05	26.00

BRONZE CARRIAGE BOLTS

Cut Threads

Length Inches	Size, Inches						
	1/4	5/16	3/8	7/16	1/2	5/8	3/4
2	$4.60	$5.85	$10.40	$14.60	$18.75	$30.40	$52.50
2½	5.45	6.70	11.70	16.70	22.95	32.90	55.00
3	5.85	7.95	13.35	18.35	25.00	36.25	57.10
3½	6.25	8.75	14.20	19.60	27.90	39.60	63.35
4	7.10	9.60	15.85	21.70	30.45	42.90	64.60
4½	7.50	10.45	16.70	22.50	31.70	45.85	72.50
5	7.95	11.70	18.35	25.40	33.75	46.70	76.70
5½	8.75	12.10	19.60	26.25	35.40	47.50	79.20
6	9.60	12.95	22.10	27.50	37.10	58.35	83.35
6½	....	....	22.50	28.75	40.00	59.20	....
7	....	....	22.95	....	41.25	65.85	....
8	....	....	26.25	....	47.10	70.00	....

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STOVE AND HANGER BOLTS

STOVE BOLTS

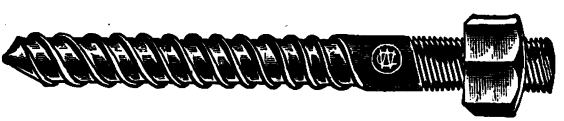
Iron, Black or Galvanized—Per Hundred

Diameter Inches	Length, Inches											
	1½	1¾	2	2¼	2½	3	3½	4	4½	5	5½	6
3/16	$1.10	1.15	1.20	1.25	1.30	1.50	1.70	1.90	...	...	...	...
¼	1.50	1.55	1.60	1.70	1.80	2.00	2.20	2.40	2.60	2.85	3.15	3.45
5/16	...	...	2.30	2.40	2.50	2.70	3.00	3.30	3.60	3.90	4.30	4.70
⅜	...	...	...	...	...	4.20	4.60	5.00	5.40	5.80	6.20	6.60

Brass—Per Hundred

Diameter Inches	Length, Inches											
	1½	1¾	2	2¼	2½	3	3½	4	4½	5	5½	6
3/16	$3.12	3.20	3.36	3.48	3.60	4.00	4.80	5.20	...	...	...	...
¼	4.56	4.76	5.00	5.36	5.72	5.96	6.52	7.12	7.80	8.60	9.00	9.40
5/16	...	...	8.12	8.40	9.00	10.20	11.00	11.80	13.00	14.20	15.40	16.60
⅜	...	...	...	...	...	12.00	13.00	14.00	15.00	16.00	17.00	18.00

BRONZE HANGER BOLTS



Machine Cut Thread, Hexagon Nut—Per Hundred

Length Inches	⅜	½	⅝
3	$12.00	$16.00	....
3½	13.00	18.00	....
4	14.00	20.00	$32.00
5	16.00	24.00	36.00
6	20.00	28.00	40.00
7	....	....	44.00

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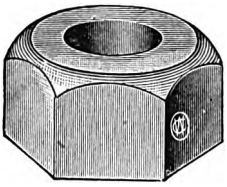
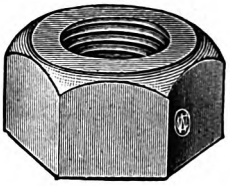
NUTS, WASHERS, ETC.



HEXAGON NUTS

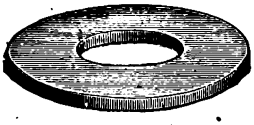
Galvanized Iron and Cast Bronze



Per Pound

For bolt, diam., in...	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
Galvanized, blank ...	$0.30	.27	.22	.20	.16	.16	.15	.13	.13	.13	.13	.14	.14	.15
Galvanized, tapped ..	.44	.39	.33	.31	.26	.25	.21	.19	.19	.19	.19	.19	.20	.21
Bronze, blank	.60	.60	.56	.56	.52	.50	.50	.50	.50	.50	.50	.50	.50	.50
Bronze, tapped	.75	.75	.70	.70	.65	.60	.60	.60	.60	.60	.60	.60	.60	.60

WASHERS



Iron and Brass

Size Hole Inches	Diam. Inches	Bolt Size Inches	Black Per Lb.	Galv. Per Lb.	Brass Per Lb.
1/4	9/16	3/16	$0.14	.25	1.00
5/16	3/4	1/4	.122	.22	.80
3/8	7/8	5/16	.114	.18 1/4	.80
7/16	1	3/8	.105	.17 1/2	.70
1/2	1 1/4	7/16	.098	.15 1/2	.60
9/16	1 3/8	1/2	.094	.15	.60
5/8	1 1/2	9/16	.093	.15 1/2	.60
11/16	1 3/4	5/8	.092	.14	.55
13/16	2	3/4	.091	.14	.55
15/16	2 1/4	7/8	.09	.14	.55
1 1/16	2 1/2	1	.09	.14	.55
1 1/4	2 3/4	1 1/8	.09	.14	.55
1 3/8	3	1 1/4	.092	.14	.55
1 1/2	3 1/4	1 3/8	.092	.14	.55
1 5/8	3 1/2	1 1/2	.092	.14	.55
1 3/4	3 3/4	1 5/8	.095	.15	.60
1 7/8	4	1 3/4	.095	.15	.60
2	4 1/4	1 7/8	.095	.15	.60
2 1/8	4 1/2	2	.095	.15	.60

GALVANIZED BURRS

Swedes Iron

For Rivets

Hole, in	1/8	5/32	3/16	7/32	1/4	9/32
Pound	$0.41	.36	.34	.31	.29	.29

Hole, in.	5/16	11/32	3/8	13/32	7/16	1/2
Pound	$0.29	.29	.29	.29	.29	.29

Made with particular reference to boat building.

CLINCH RINGS

Malleable Iron

Size hole, 3/8, 7/16, 1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, 1, 1 1/16, 1 1/8, 1 3/16, 1 1/4, 1 3/8, 1 1/2.

Galvanized, per lb..... $0.12

Plain, per lb..... .09

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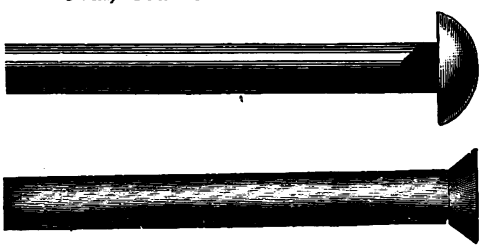
RIVETS

BOAT RIVETS

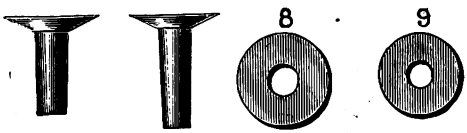
Galvanized

Oval, Countersunk or Flat Head



Diam., In	Length, In.	Per Pound
3/16	2½ to 5	$0.16
¼	2½ to 6	.15½
5/16	2½ to 8	.15½
⅜	3 to 10	.15
7/16	3 to 10	.15
½	4 to 10	.15

COPPER RIVETS AND BURRS



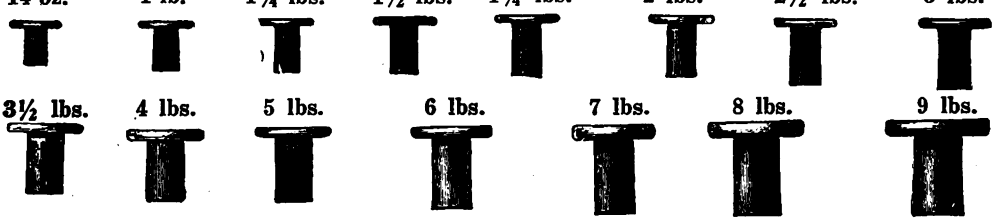
Nos.	5 to 7	8	9	10	11
Per lb.	$0.49	.50	.52	.54	.56
Nos.		12	13	14	15
Per lb.		$0.58	.60	.65	.70

Prices are for uniform lengths of ⅜ to 1 inch, in 1 lb. boxes.

Rivets only, same price as rivets and burrs.

Burrs only, same price as rivets and burrs.

IRON RIVETS



Size	In Packages of 1000, Per 1000 — Black	Metallic Tinned	Tin Plated	In 5 & 10 Lb. Boxes Per Pound — Black
6 oz.	$0.20	$0.28	$0.24	$0.48
8 oz.	.22	.31	.26	.42
10 oz.	.24	.35	.29	.38
12 oz.	.26	.39	.32	.35
14 oz.	.28	.43	.35	.33
1 lb.	.29	.47	.37	.30
1¼ lbs.	.32	.54	.42	.27
1½ lbs.	.37	.64	.49	.26
1¾ lbs.	.41	.72	.55	.25
2 lbs.	.44	.79	.59	.24
2½ lbs.	.56	1.00	.75	.24
3 lbs.	.62	1.15	.85	.23

Size	In Packages of 1000, Per 1000 — Black	Metallic Tinned	Tin Plated	In 5 & 10 Lb. Boxes Per Pound — Black
3½ lbs.	$0.72	$1.34	$0.99	$0.23
4 lbs.	.79	1.49	1.09	.22
5 lbs.	1.00	1.88	1.38	.22
6 lbs.	1.12	2.17	1.57	.21
7 lbs.	1.31	2.54	1.84	.21
8 lbs.	1.50	2.90	2.10	.21
9 lbs.	1.68	3.26	2.36	.21
10 lbs.	1.77	3.52	2.52	.20
12 lbs.	2.06	4.16	2.96	.19½
14 lbs.	2.40	4.85	3.45	.19½
16 lbs.	2.77	5.57	3.97	.19½

List Extras. For oval or countersunk heads, shoulder and pointed or extra length rivets, add 10 cents per 1000 to list price for each specialty.

Net Extras. For tin plating or copper plating, add 1½ cents per pound to net price. For metallic tinning, add 3½ cents per pound to net price. When "Tinned" Rivets are ordered, metallic tinned are furnished.

List Rebates. For 25 and 50 lb. boxes, deduct 2 cents. For 100 and 200 lb kegs, deduct 4 cents per pound from list price.

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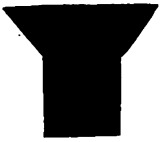
RIVETS

SHIP, BOILER AND STRUCTURAL RIVETS

Countersunk Head



Cone Head

Button Head

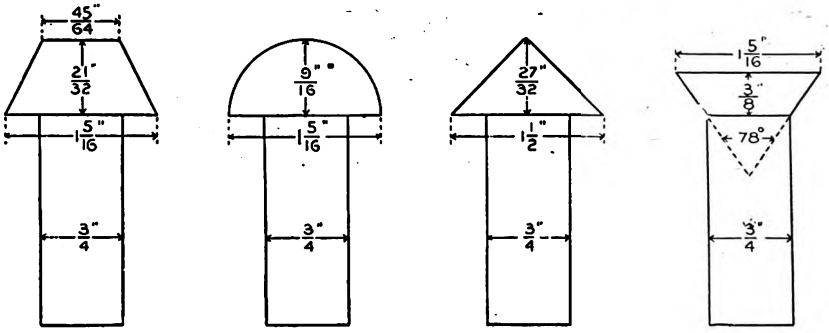
Standard heads, ¾ to 1¼ in. diameter and 2 to 5 in. long.....Base

Above rivets are in kegs or bags weighing 200 or 300 pounds.

Extras Per 100 Pounds

½ and $\frac{9}{16}$ inch diameter	$0.50	Flat head rivets	$0.25
⅝ and $\frac{11}{16}$ inch diameter	.15	Standard countersunk head rivets	.25
Over 1¼ inch diameter	.25	Swellneck rivets	.25
1 inch and shorter	.50	Special heads, minimum	.25
Over 1 inch and under 2 inches long	.25	In 100 lb. packages	.10
Over 5 inches long	.25		

DIMENSIONS FOR STANDARD HEADS



Cone Button Staple Countersunk

Formulae for Finding Dimensions

Cone Head: Least diameter, $\frac{15}{16}$ times diameter of rivet shank. Greatest diameter, 1¾ times diameter of rivet shank. Height, ⅞ times diameter of rivet shank.

Button Head: Diameter, 1¾ times diameter of rivet shank. Height, ¾ times diameter of rivet shank.

Steeple Head: Diameter, 2 times diameter of rivet shank. Height, equal to 1⅛ times diameter of rivet shank.

Flat Head Countersunk: Height, ½ times diameter of rivet shank. 78 degrees taper.

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SPRING COTTERS

All Measurements Made Under the Eye

List in Effect July 21, 1911. Superseding All Previous Lists

Wire Gauge Size	Size	Per 1000
No. 13	3/32 x ½	$3.50
	3/32 x ⅝	4.15
	3/32 x ¾	4.15
	3/32 x ⅞	4.80
	3/32 x 1	4.80
	3/32 x 1¼	5.45
	3/32 x 1½	6.10
	3/32 x 1¾	6.75
	3/32 x 2	7.40
No. 12	7/64 x ½	4.00
	7/64 x ¾	4.75
	7/64 x 1	5.50
	7/64 x 1¼	6.25
	7/64 x 1½	7.00
	7/64 x 1¾	7.75
	7/64 x 2	8.50
No. 11	⅛ x ½	5.00
	⅛ x ¾	5.85
	⅛ x 1	6.70
	⅛ x 1¼	7.55
	⅛ x 1½	8.40
	⅛ x 1¾	9.25
	⅛ x 2	10.10
	⅛ x 2¼	10.95
	⅛ x 2½	11.80
No. 10	9/64 x ¾	7.00
	9/64 x 1	8.00
	9/64 x 1¼	9.00
	9/64 x 1½	10.00
	9/64 x 1¾	11.00
	9/64 x 2	12.00
	9/64 x 2¼	13.00
	9/64 x 2½	14.00
No. 9	5/32 x ½	7.00
	5/32 x ¾	8.15
	5/32 x 1	9.30
	5/32 x 1¼	10.45
	5/32 x 1½	11.60
	5/32 x 1¾	12.75
	5/32 x 2	13.90
	5/32 x 2¼	15.05
	5/32 x 2½	16.20
No. 8	11/64 x 1	10.60
	11/64 x 1¼	11.90
	11/64 x 1½	13.20
	11/64 x 1¾	14.50
	11/64 x 2	15.80
	11/64 x 2¼	17.10
	11/64 x 2½	18.40
No. 7	3/16 x ¾	$11.10
	3/16 x 1	12.80
	3/16 x 1¼	14.50
	3/16 x 1½	16.20
	3/16 x 1¾	17.90
	3/16 x 2	19.60
	3/16 x 2¼	21.30
	3/16 x 2½	23.00
	3/16 x 2¾	24.70
	3/16 x 3	26.40
No. 6	13/64 x 1	14.00
	13/64 x 1¼	16.00
	13/64 x 1½	18.00
	13/64 x 1¾	20.00
	13/64 x 2	22.00
	13/64 x 2¼	24.00
	13/64 x 2½	26.00
	13/64 x 2¾	28.00
	13/64 x 3	30.00
No. 5	7/32 x 1	18.00
	7/32 x 1¼	20.80
	7/32 x 1½	23.60
	7/32 x 1¾	26.40
	7/32 x 2	29.20
	7/32 x 2¼	32.00
	7/32 x 2½	34.80
	7/32 x 2¾	37.60
	7/32 x 3	40.40
No. 4	¼ x 1	20.00
	¼ x 1¼	23.50
	¼ x 1½	27.00
	¼ x 1¾	30.50
	¼ x 2	34.00
	¼ x 2¼	37.50
	¼ x 2½	41.00
	¼ x 2¾	44.50
	¼ x 3	48.00
	¼ x 3¼	51.50
	¼ x 3½	55.00
	¼ x 3¾	58.50
	¼ x 4	62.00
No. 1	5/16 x 1	32.50
	5/16 x 1¼	37.50
	5/16 x 1½	42.50
	5/16 x 1¾	47.50
	5/16 x 2	52.50
	5/16 x 2¼	57.50
	5/16 x 2½	62.50
No. 1	5/16 x 2¾	$67.50
	5/16 x 3	72.50
	5/16 x 3¼	77.50
	5/16 x 3½	82.50
	5/16 x 3¾	87.50
	5/16 x 4	92.50
	⅜ x 1½	72.00
	⅜ x 1¾	79.20
	⅜ x 2	86.40
	⅜ x 2¼	93.60
	⅜ x 2½	100.80
	⅜ x 2¾	108.00
	⅜ x 3	115.20
	⅜ x 3¼	122.40
	⅜ x 3½	129.60
	⅜ x 3¾	136.80
	⅜ x 4	144.00
	7/16 x 1¾	108.00
	7/16 x 2	119.50
	7/16 x 2¼	131.00
	7/16 x 2½	142.50
	7/16 x 2¾	154.00
	7/16 x 3	165.50
	7/16 x 3¼	177.00
	7/16 x 3½	188.50
	7/16 x 3¾	200.00
	7/16 x 4	211.50
	7/16 x 5	257.50
	½ x 2	148.50
	½ x 2¼	163.50
	½ x 2½	178.50
	½ x 2¾	193.50
	½ x 3	208.50
	½ x 3¼	223.50
	½ x 3½	238.50
	½ x 3¾	253.50
	½ x 4	268.50
	½ x 5	328.50
	½ x 6	388.50
	⅝ x 3	384.00
	⅝ x 3¼	404.00
	⅝ x 3½	424.00
	⅝ x 3¾	444.00
	⅝ x 4	464.00
	⅝ x 5	544.00
	⅝ x 6	644.00

List and discount to apply to standard packages only. When ordered in packages other than regular, subject to extra charge for packing and boxes at cost. List on brass cotters eight times the list of steel.

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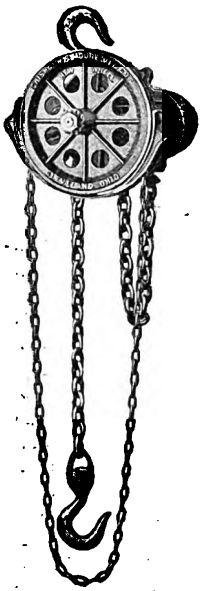

¼ Ton to 3 Tons

CYCLONE HOISTS

HIGH SPEED

There are four features which should be fundamental in a chain hoist. These are, speed, safety, ease of operation and durability. Cyclone Hoists are built to perfectly fill all these requirements.

Cyclone Hoists are the only hoists containing a gyrating yoke. This gives a powerful, sure-action drive, remarkably free from frictional losses, a high speed and smooth, positive action. Every gear is cut. An automatic multiple disc brake holds the load in any position. The patented hand chain guard insures a free-running movement of the hand chain —no possibility of the chain backlashing.

The hoist frame, or housing, is of high grade malleable iron. It has great strength and is practically non-destructible.

Every hoist will stand an overload of 50%.

4 Tons to 12 Tons

Price List

Capacity Tons	Price Complete	Height of Lift Feet	Extra Chain per Foot of Lift	Net Weight Comp. with Chains Pounds	Gross Weight Boxed Pounds	Chain Pull to Lift Full Load Pounds	Length of Chain Handled to Lift Load One. Ft. No. Feet	Shortest Distance Between Hooks Inches
¼	$60.00	8	$1.80	48	65	70	9	13
½	70.00	8	1.80	71	90	56	20	15
1	90.00	8	1.90	99	110	79	33	17
1½	120.00	8	2.00	118	135	102	39	19
2	140.00	9	2.10	161	190	109	47	21
3	180.00	10	2.60	226	285	115	70	23
4	220.00	10	3.20	260	360	120	91	34
5	280.00	12	4.20	376	455	104	123	38
6	330.00	12	4.60	410	475	109	140	41
8	400.00	12	5.00	484	555	135	159	43
10	480.00	12	6.00	652	730	144	191	47
12	600.00	12	6.00	695	780	160	195	50
16	720.00	12	10.00	872	1020	*75	285	44
20	850.00	12	12.00	1600	1927	*90	336	50
30	1050.00	12	17.00	1860	2187	*90	504	63
40	1300.00	12	22.00	2120	2555	*90	670	82

*On each hand wheel.

We can furnish, without extra charge, Cyclone Hoists in the quarter-ton, half-ton and one-ton sizes with special gearing to handle light loads at a higher speed. They will require, however, a proportionately greater hand chain pull.

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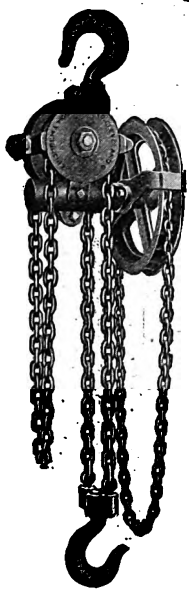
STANDARD SCREW CHAIN HOISTS



This is a powerful and easy-working block, made on the well-known principle of the worm and gear. Where a high speed hoist like the Cyclone is not needed, this hoist is suitable, especially where smooth motion is desired, as it has no vibration. The hoist always hangs plumb.

It is readily adaptable to horizontal work for pulling heavy loads on skids and rollers. All working parts are protected from weather and dust. The bronze worm wheel and steel worm which have hardened and ground thrust bearings, run in oil, insuring smooth action and thorough lubrication.

Price List

Capacity Tons	Price Complete	Extra per Ft. of Lift	Height of Lift Feet	Net Weight Complete with Chains Pounds	Gross Weight Boxed Pounds	Shortest Distance Between Hooks Inches	Chain Over-hauled to Raise One Ft. Feet	Chain Pull to Lift Full Load Pounds
½	$50.00	$2.50	8	56	70	16	47	49
1	60.00	2.60	8	71	90	17	57	87
1½	80.00	2.70	8	81	100	17	71	94
2	100.00	2.80	9	99	126	20	92	128
3	150.00	3.00	10	157	245	24	119	132

DIRECT DIFFERENTIAL PULLEY BLOCKS

A cheap, simple and reliable type of block.

The chain is endless, passing around a large double sheave at the top and a single sheave at the bottom. The chain is of special material; tested to a pull 50% greater than the maximum load it is intended to carry; and carefully fitted to gauge to insure accurate gearing with the properly formed pockets in the sheaves.

This causes the block to run easily and smoothly under load and precludes the stretching of the chain.

Power is applied by pulling directly on the slack part of the load chain and is multiplied by the simple device of the "Differential" sheave.

Having fewer parts than any other type of chain block, it consequently has the advantage also of being exceptionally light in weight.

It is a useful hoist where economy of time and labor is unimportant and low first cost the chief requirement.

Price List

Capacity Tons	Will Lift Feet	Price	Reg. Chain Feet	Extra Chain per Ft.	Net Weight Pounds	Gross Weight Boxed Pounds	Shortest Distance Between Hooks Inches	Length of Chain Handled to Lift Load One Ft. Feet
¼	6	$36.00	22	$1.40	22	25	17	18
½	7	42.00	26	1.40	30	40	21	24½
¾	8	50.00	30	1.50	35	45	25	29½
1	8	56.00	30	1.50	50	60	26	29½
1½	8½	72.00	32	1.60	81	100	32	35½
2	9	90.00	34	1.70	125	145	38	38
3	10	120.00	38	2.00	180	210	41	39

NOTE—Four lineal feet of chain are required to make one foot of lift.

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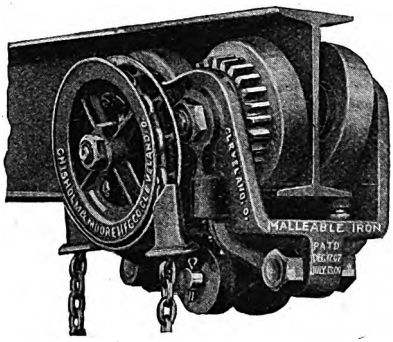
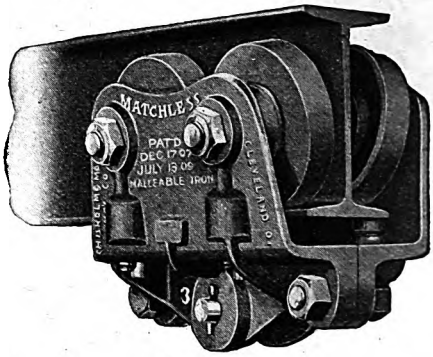
C-M MATCHLESS ADJUSTABLE MALLEABLE FRAME TROLLEYS

GEARED



PLAIN



These trolleys are readily adjusted to the different size I-beams specified in the price list. They have flangeless track wheels with vertical guide rollers.

The track wheels have hardened steel roller bearings (hardened steel bushings pressed into the wheels, hardened steel axles and hardened steel rollers enclosed in cages).

On the geared trolley, the gears are cut. They work very freely and have a large safety factor.

The hoist is to be hung on the central bolt. The top of the hoist hook reaches to within one and one-half inches of the I-beam, making a very close connection.

The fact that these trolleys are adjustable admits of their being carried in stock.

To lubricate track wheels, force grease through the holes in exposed ends of the axle studs. This can be done without taking the trolley down.

Price List

Capacity Pounds	Tread Diameter of Wheel Inches	Adjustable for Sizes I-beams Inches	Geared	Plain	Weight Geared Pounds	Weight Plain Pounds
1000	4	5 6 7	.....	$32.00	...	35
2000	4¾	6 7 8	$70.00	40.00	60	47
3000	4¾	6 7 8	76.00	52.00	70	56
4000	5¾	7 8 9	80.00	56.00	90	74
6000	6½	8 9 10	94.00	66.00	118	102
8000	7	9 10 12	104.00	74.00	177	155
10000	8	10 12 15	130.00	86.00	218	194
12000	8	10 12 15	160.00	110.00	265	240
16000	9	12 15 18	190.00	140.00	421	378
20000	10	15 18 20 24	230.00	170.00	480	434
24000	10	15 18 20 24	260.00	220.00	600	550

In ordering, state size and weight of I-beam.

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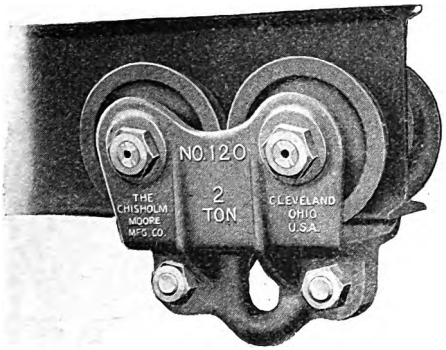
C-M NO. 120 PLAIN TROLLEY



Has malleable iron frame, four wheels with roller bearings.

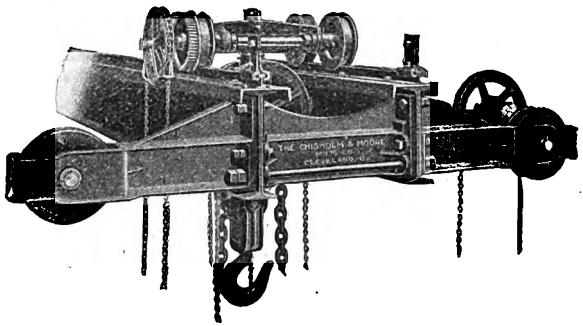
Designed for light and occasional work such as is usually found around garages and small machine shops. Where constant service, heavy duty and long life are essential, the "Matchless" type of trolley, described on page 360 is recommended.

Price List

Capacity Pounds	For I-beams See Foot Note Inches	Tread Diam. of Wheel Inches	Net Weight Pounds	Price
500	3	2	14	$14.00
	4	3	25	
1000	5 or 6	3¾	29	16.00
2000	5 or 6	3¾	33	21.00
3000	6 or 7	4½	52	27.00
4000	7 or 8	5½	72	34.00

In ordering, size and weight of I-beam must be specified

C-M HAND POWER TRAVELING CRANES



We are prepared to quote attractive prices on many hand traveling types of various spans and capacities. Also swinging mast, wall bracket jib and transfer cranes. All built to conform to user's specifications. Blue prints and full particulars furnished on application.

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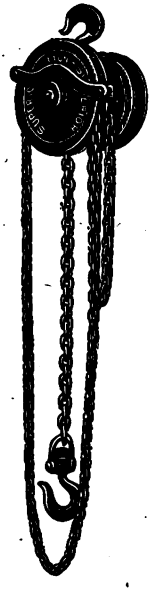
SUPERIOR CHAIN BLOCKS

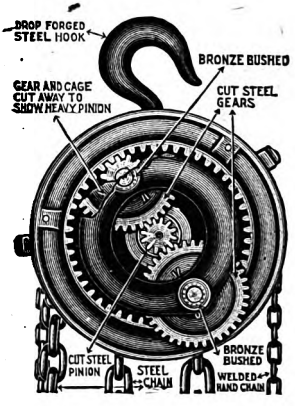


TRIPLE-GEARED

Modern methods demand speed and ease in lifting. This block combines both. The market offers nothing faster or easier lifting except complicated electric hoists, which cannot be carried around to every part of your plant like "Superior" Blocks, and cost many times more.

It is the most powerful block ever built. Made in 13 sizes to lift from ½ ton to 20 ton loads.

"Superior" Blocks are the most efficient. This is due largely to the fact that load is sustained by a method entirely separate from the lifting mechanism, and not by friction of the working parts as in most blocks.



Sectional View Showing Gearing (Dust Proof Cover Removed)

This means the elimination of friction and gives the "Superior" Block an average efficiency of over 80%, which returns in actual lifting all the work put into the block except 20%.

With these facts it is easy for you to estimate the saving effected by using this high speed, easy lifting block, when you stop to consider that other types of hoists have efficiencies ranging from 30% to 40%.

The patent hand chain guide absolutely prevents fouling or gagging of the chain.

A simple balanced train of powerful steel gears forms the hoisting mechanism of the "Superior" Block. In all these years not one of these gears has ever come back to us broken. A pull on the hand chain turns the central pinion which causes the two intermediate gears to move. These engage through their pinions, with the large internal gear which, acting as a fulcrum, forces the pinion cage to turn. To this pinion cage is keyed the load chain sheave which raises the load. Such construction saves you repair bills.

Capacity in Tons	Regular Hoist in Feet†	Reach Ft.	Reach In.	Minimum Distance Between Hooks in Inches	Chain Pull in Pounds to Lift Full Load	Feet of Chain Handled to Load 1 Ft.	Weight in Pounds Net	Weight in Pounds Gross	Each Complete	Extra Hoist per Foot
½	8	9	3	15	62	21	53	67	$70.00	$1.80
1	8	9	5	17	82	31	80	96	90.00	1.90
1½	8	9	7½	19½	110	35	124	145	120.00	2.00
2	9	11		24	120	42	188	212	140.00	2.10
3	10	12	8	32	114	69	200	230	180.00	3.00
4	10	13	1	37	124	84	290	318	220.00	3.20
5	12	15	9	45	110	126	380	428	280.00	4.30
6	12	15	10	46	130	126	390	445	350.00	4.30
8	12	16	3	51	135	168	470	505	400.00	5.40
10	12	16	9	57	140	210	570	625	480.00	6.50
12	12	16	9	57	*130	*126	800	910	600.00	8.60
16	12	17	1	61	*135	*168	1000	1115	720.00	10.80
20	12	18	5	77	*140	*210	1375	1640	850.00	13.00

†These figures show the height to which blocks, furnished with the regular amount of chain, will hoist above the level on which the operator stands. We can furnish any length hoist desired.

*Two hand chains on these sizes—figures are for each hand chain.

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WESTON DIFFERENTIAL BLOCKS

The Weston Differential Block is the simplest chain block made and lowest in first cost. For occasional work, and general use about garages, stores, small shops and store houses this hoist is satisfactory.

The wheels are especially made to insure perfect meshing with the accurate fitting steel chain used. All castings are of proper size, weight and design to insure full strength and to reduce extra friction.

Every Differential Block sold by us is thoroughly tested before being shipped. You will find them durable and dependable.

Capacity in Tons	Will Hoist in Feet	Chain Pull Required Lbs.	Chain Pull Required Ft.	Gross Weight in Pounds
¼	6	72	18	37
½	7	122	24	45
1	8	215	30	64
1½	8½	245	36	100
2	9	308	42	144
3	10	557	38	200

Capacity of Block	Each Complete	*Extra Hoist per Foot	Regular Chain Complete Each	Sheaves Top	Sheaves Bottom	Yokes and Hooks Top	Yokes and Hooks Bottom
¼ ton	$36.00	$5.60	$21.00	$7.20	$1.80	$6.00	$4.50
½ ton	42.00	5.60	25.00	9.60	2.60	7.50	6.00
1 ton	56.00	6.00	34.00	12.00	3.00	9.00	7.50
1½ ton	72.00	6.40	43.00	16.80	3.80	11.00	9.00
2 ton	90.00	6.80	54.00	24.00	4.50	15.00	11.00
3 ton	120.00	8.00	72.00	30.00	7.50	22.00	16.00

*Each foot of extra hoist includes 4 feet of chain.

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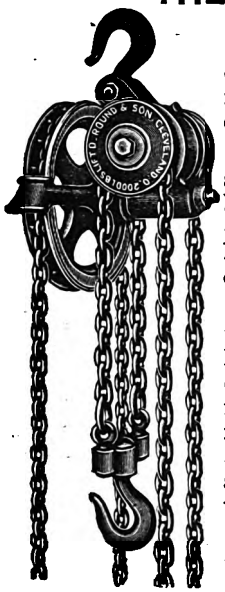
THE ROUND IMPROVED SCREW HOISTS

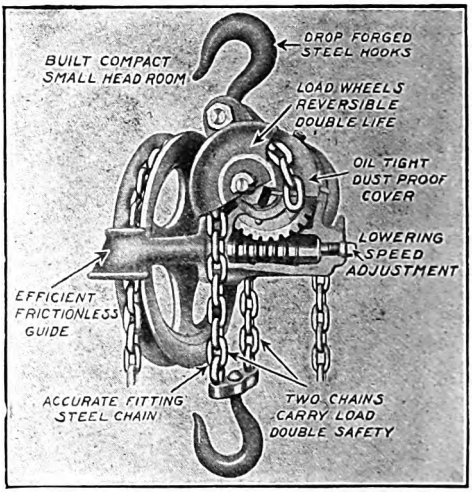


The particular advantage of this type of hoist is its medium cost and easy lifting qualities.

If you do not need the speed of a "Superior" Block but want a moderate priced, dependable, easy working hoist, this is the style to order.

It costs but little more than a Weston Differential Block, but lifts so much easier and takes only one man instead of four that it is in universal use in garages, stores, shops, boats and places where hoisting is to be done economically.

Where head room is limited this type is especially efficient as the room it requires is very small in comparison with other types. For this reason it is widely used for trolley systems and in low buildings.



Sectional View of Round Improved Screw Hoist

A thrust screw at the end of the worm gear may be adjusted for changing speed in lowering where it is desired.

With this type the load is carried on two distinct chains, either of which is strong enough to handle it alone.

The heavy load chain may be removed when the hoist is being put up in a new position. Not all screw hoists have this feature as it is an advantage of Round's improved design.

The operator can remove any twist in the load chain quickly as the load chain swivels in the bottom cross bar.

The load wheels are reversible. This gives them practically double life.

All working parts are enclosed in oil tight dust proof case, assuring perfect lubrication.

Capacity in Tons	*Regular Lift in Feet	†Reach Ft.	†Reach In.	Pull on Hand Chain to Lift Full Load in Pounds	Feet of Chain Handled to Lift Load One Foot	Shortest Distance Between Hooks in Inches	Gross Weight in Pounds	Net Weight of Hoist in Pounds	Each Complete	Extra Lift per Foot
½	8	9	5	49	60.5	17	97	68	$50.00	$2.40
1	8	9	6	71	76.0	18	103	75	60.00	2.60
1½	8	9	7	99	89.5	19	144	106	80.00	2.80
2	9	10	10	129	98.0	22	215	160	100.00	2.88
3	10	12	6	163	98.0	30	324	247	150.00	3.00
4	10	12	8	190	128.0	32	419	325	190.00	3.40
5	12	15	3	293	106.5	39	620	480	280.00	4.40
6	12	15	3½	293	110.0	39½	760	550	360.00	5.00
8	12	15	5	403	148.0	41	886	735	420.00	5.80
10	12	15	11	358	198.0	47	972	785	550.00	5.80

*These figures show the height which blocks furnished with the regular amount of chain will hoist above the level on which operator stands. Can furnish any length hoist desired.

†The "Reach" is the sum of the "lift" and the "shortest" distance between hooks or in other words the length of the lift plus the hoist gearing.

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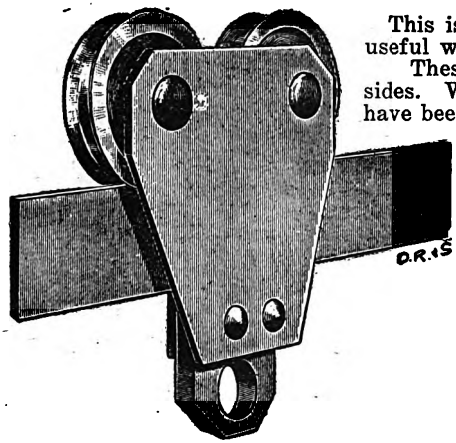
ROUND PLAIN RAIL TROLLEYS



This is the simplest trolley system made. Particularly useful where lateral travel is short and load light.

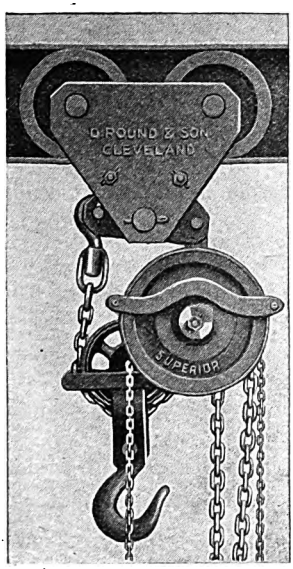
These trolleys are strongly made and have steel plate sides. Wheels are made as large as average conditions have been found to permit.

Flat or plain rail trolley systems are not, of course, as satisfactory as I-beam systems for all purposes. It has the advantage, however, in being easy to erect and the rail may be easily bent for curves.

Capacity Pounds	Rail Inches	Distance Between Hangers Feet	Plain Like Cut
500	3x½	6	$10.00
1000	3x½	5	11.00
2000	4x¾	6	15.00
3000	4x¾	5	16.00
4000	4x¾	4	17.00
6000	6x1	6	30.00

Net price quoted on Hangers

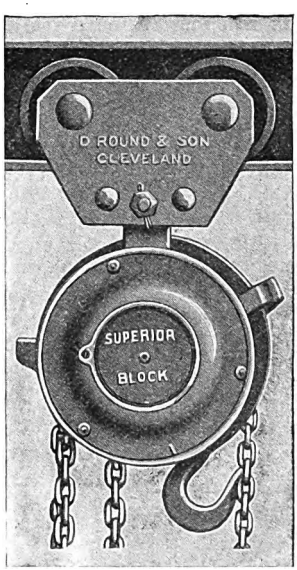
COMBINED TROLLEYS AND BLOCKS



SUPERIOR BLOCKS

The usefulness of a Superior Block is increased many times by attaching it to an overhead trolley of either the plain or geared type. This makes it possible to lift a load and transport to any position desired.

Warehouses, store rooms, small shops, etc., find this system of great usefulness. Every available foot of space may be utilized in storing away boxes, barrels, etc., as this system operates easily where the head room is very limited. Special clevis devices are used for attaching Superior Blocks to trolleys in such instances. Where head room saving is not necessary the use of regular hooks provided means greater convenience in detaching the block. Complete with clevis connection.



Capacity Tons	Standard Sizes of I-beam Inches	Regular Hoist *Feet	Minimum Distance from Bottom of I-beam to Inside of Lower Hook Inches	With Plain Trolley Each	With Geared Trolley Each
½	5	8	13	$110.00	.....
1	6	8	17	140.00	$200.00
1½	7	8	20	180.00	250.00
2	8	9	21	210.00	280.00
3	9	10	34	260.00	320.00
4	10	10	38	320.00	410.00

*For price of extra hoist with plain trolley see regular Superior Block, page 362.
Extra hoist with geared trolley, same price as extra hoist for Superior Block plus $1.00 a foot.

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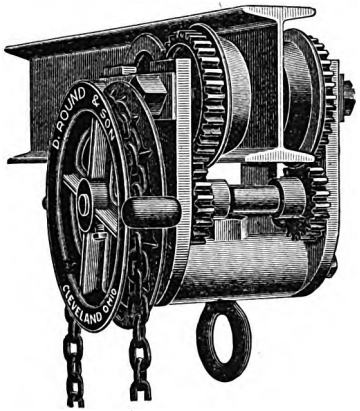
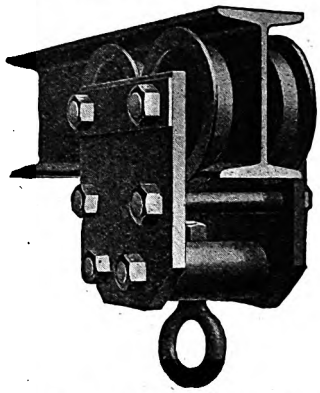
I-BEAM TROLLEYS

USED IN CONNECTION WITH CHAIN BLOCKS FOR MOVING LOADS





The most desirable method for mills, foundries, machine shops and other big industrial plant store room and shipping room purposes is the overhead I-beam on which may be run one or more trolleys with chain hoists attached.

Floor trucking, compared with this modern, speedy, convenient method of transportation, is extremely costly because of the floor space required in operating and the labor involved. An I-beam trolley is up out of the way, requires no floor space and one man can do the work of four.

Round steel I-beam trolleys are made in both plain and geared types, and in all capacities from one to ten tons.

For heavy loads (3 ton and over) the geared trolley should be used. Light loads can be handled more efficiently by the plain trolley.

The four wheels on each trolley are straight faced and set at an angle so there is no grinding action as the trolley travels on the beveled edge of the I-beam track.

Heavy steel pins support these wheels, they run on roller bearings in all sizes. The equalizing cross bar connecting the two halves of the trolley may be taken out and trolley adjusted to I-beam at any point. Another feature is the construction of the whole trolley in relation to this cross bar so that the load is evenly distributed, thereby maintaining the most important essential—safety.

Four Wheeled Wrought Iron

Capacity	Standard Light Section I-beam Inches	Plain Each	Geared Each
1000	6	$40.00	$62.00
2000	6	42.00	70.00
3000	7	50.00	76.00
4000	8	56.00	80.00
6000	9	66.00	94.00
8000	10	74.00	104.00
10000	12	86.00	130.00
12000	15	110.00	140.00
16000	20	140.00	190.00
20000	24	170.00	220.00

Can be furnished to fit any size I-beam. State size and width of lower flange on special I-beams. Trolleys for larger than standard I-beams are at an additional price on application.

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GRINDSTONES, SANDPAPER, ETC.

SAMSON WOOD FRAME GRINDSTONES

With selected stone and patent interchangeable fixture.

Also furnished with trough instead of frame when so ordered.

Number Roller Bearing	Number Ball Bearing	Weight Stone Pounds	Thickness Inches	Each Roller Bearing	Each Ball Bearing
160	160B	40-50	1¾-2¼	$4.50	5.00

SAND PAPER AND EMERY CLOTH

Sand Paper

Emery Cloth

Sand Paper

In sheets 8¾x10½ inches

Nos.	00-0	½	1	1½	2	2½
Per ream	$4.50	4.80	5.40	6.10	6.90	7.80

Emery Paper

In sheets 9x11 inches

Nos.	00-0	½	1
Per ream	$10.00	10.80	11.90
Nos.	1½	2	2½
Per ream	$13.60	15.70	18.00

Crocus and Emery Cloth

In sheets 9x11 inches

Nos.	Crocus	00	½	1
Per ream	$30.00	30.00	31.20	32.75
Nos.		1½	2	2½
Per ream		$34.30	36.50	39.40

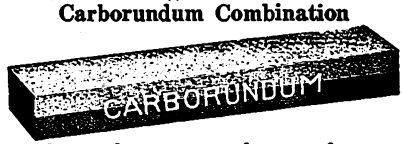
STEEL WOOL

1 lb. packages; size of package 17x3½ in.

	Per Lb.
No. 10 For rough rubbing in place of pumice	$1.50
No. 11 Equal to No. 0 sandpaper	1.10
No. 12 Equal to No. ½ or No. 1 sandpaper	1.04
No. 13 Equal to No. 1½ or No. 2 sandpaper	.84

OIL AND WATER STONES

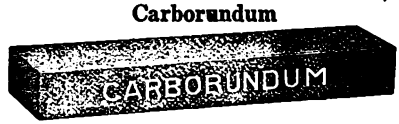
Carborundum Combination



One face of coarse and one of very fine grit. The coarse side can be used for sharpening very dull tools; the fine side for giving required keen, lasting edge.

No.	Size, Inches	Per Dozen
108	8x2x1	$18.00

Carborundum



Positively unequaled for rapid cutting qualities. Used dry or with water or oil. They are quite porous and may be tempered in their cutting by filling with wax or vaseline. Fine, medium or coarse.

No. 115 ..... per doz., $15.00

EMERY

	Per Lb.
Grain sizes 60, 70, 80, 90, 100, 120	$....
Flour or F grain	....

Valve Grinding Compound

Carborundum

A mixture of fast cutting carborundum grains and a high grade grease. It leaves the valve and seat clean and true. Fine or coarse.

Cans, lb.	1	5
Each	$1.25	5.00

Ground Glass

Per lb. ..... $....

Rotten Stone

Per lb. ..... $....

Fuller's Earth

Per lb. ..... $....

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POLISHES

U. S. METAL POLISH PASTE

For polishing brass, copper, gold, silver, plated ware, nickel, etc.

Size	3 oz.	8 oz.	1 lb.	5 lb.	10 lb.	25 lb.
Per doz.	$1.20	2.50	4.50	18.00	32.40	78.00

SOLARINE METAL POLISH

For all kinds of metals.

Can be used effectively wherever there is a piece of metal that needs polishing.

No.	Quantity	Per Doz.
0	⅙ pint	$....
1	½ pint	....
2	1 pint	....
3	1 quart	....
5	1 gallon	....

SIGNET METAL POLISH

Non inflammable, gives a lasting polish.

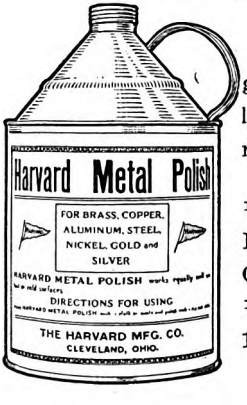
½ pint cans	each,	$0.20
Pint cans	each,	.35
Quart cans	each,	.60
½ gal. cans	each,	1.00
1 gal. cans	each,	1.50

PUTS POMADE

For polishing brass, copper, bronze or nickel.

Size	1½ oz.	3 oz.	4 oz.	8 oz.	1 lb.	5 lb.
Per doz.	$....	....	....	....	....	....

HARVARD METAL POLISH



For brass, copper, gold or silver. In liquid form, contains no acid.

	Each
½ pint cans	$....
Pint cans	....
Quart cans	....
½ gal. cans	....
1 gal. cans	....

BLUE RIBBON METAL POLISH

This polish can be used to advantage on any metal, but is particularly adapted to brass, copper and nickel.

¼ Pint	each,	$0.15
½ Pint	each,	.30
Pints	each,	.50
Quarts	each,	.80
½ gals.	each,	1.20
Gals.	each,	1.90

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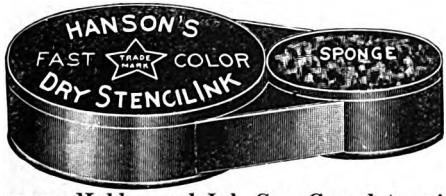
STENCILS, ETC.

ADJUSTABLE STENCILS

Size Inches	Letters Per Set (27)	Figures Per Set (15)	Single Letters or Figures
½	$0.65	$0.25	$0.02½
¾	.70	.30	.03
1	.80	.35	.04
1½	1.00	.45	.05
2	1.40	.65	.06
2½	2.00	.95	.08
3	...	..	..

STENCIL INKS



Sponge Holder and Ink Can Complete with Black Ink

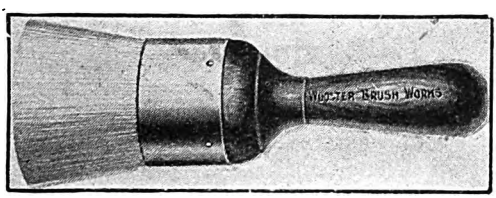
Nos.	0	1	4	5	6
Diam. in.	5½	4¼	3	2	1¾
Each	$0.50	.35	.20	.15	.10

Black Ink Cakes Only

Nos.	0	1	1 Double	4
Diam. in.	5½	4¼	4¼	3
Per doz.	$4.00	2.50	4.00	1.60

Nos 5 and 6 not sold without cans.

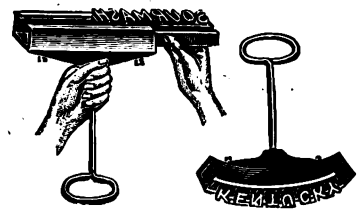
STENCIL BRUSHES



Grey bristles, zinc ferrule.

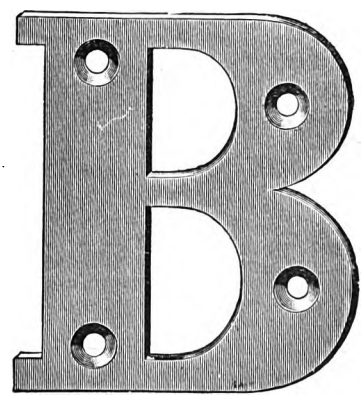
Nos.	4	6
Diam. ferrule, in.	⅞	1⅛
Each	$....	....

BURNING BRANDS



Size Letter, In.	¾	1	1¼	1½
1 letter	$1.00	1.25	1.25	1.50
2 letter	1.40	1.65	1.75	2.00
3 letter	1.70	1.85	2.00	2.50
4 letter	2.00	2.30	2.50	3.25
5 letter	2.50	3.00	3.25	4.00
6 letter	2.75	3.20	3.50	4.75
7 letter	3.25	3.90	4.25	5.50
8 letter	4.00	4.10	4.50	6.25
9 letter	4.50	4.80	5.25	7.00
10 letter	4.75	5.00	5.50	7.75
11 letter	5.00	5.70	6.25	8.25
12 letter	5.25	5.90	6.50	9.00
13 letter	5.50	6.60	7.25	...
14 letter	5.75	6.80	7.50	...

LETTERS AND FIGURES



Cast brass, countersunk for screws.

Size, in.	1	1½	2	2½	3	4	6
Letters or figures, each,	$0.12	.18	.25	.30	.40	.60	1.00

SCREEN NUMBERS

Brass, black figures, 1 to 99, ½ in.....
Per 100.....$....

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MARINE STORES

GRAPHITE

Dixon's Pure Flake Graphite

Furnished in No. 1 coarse flake, and No. 2 fine flake. In ordering specify which is wanted.

5 lb. screw top cans.....per lb., $....
10 lb. screw top cans.....per lb., ...

Dixon's Graphite No. 635

A flake graphite ground to an impalpable degree of fineness.

100 lb. kegs.....per lb., $....

WATERPROOF GRAPHITE GREASE

Dixon's

For Wire Ropes, Etc.

Possesses remarkable adhesiveness and cannot be washed off by fresh, salt, alkaline or acid waters. Is a rust preventive.

5 lb. tin cans.....per lb., $....
10 lb. tin cans.....per lb., ...
25 lb. firkins .....per lb., ...

UPSON-WALTON WIRE ROPE DRESSING

5 lb. tin cans.....per lb., $....
10 lb. tin cans.....per lb., ...
25 lb. firkins.....per lb., ...

UPSON-WALTON MANILA ROPE DRESSING

5 lb. tin cans.....per lb., $....
10 lb. tin cans.....per lb., ...
25 lb. firkins.....per lb., ...

CANDLES

Electric Light

Best paraffin wax, for general use.

6 set cartons.....per lb., $....
12 set cartons.....per lb., ...

Granite

A hard candle for warm places, or for summer use.

20 set cases.....per lb., $....
40 set cases.....per lb., ...

Coach or Plumbers

5 to the pound in 20 lb. cases..per lb., $....

TALLOW

Cake, in bbls.....per lb., $....
Solid, in bbls.....per lb., ...

BEESWAX

Pure .....per lb., $....
Sailmakers composition.....per lb., ...

In 1 lb. cakes

ROSIN

Grades	E	F	G
Per bbl., 280 lbs.....	$....	....	....

Put up in casks

PITCH

Navy in 250 lb. bbls.....per lb., $....
Roofing, about 500 lbs. in a bbl.....
.....per 100 lb., ...

PINE TAR

Quart cans.....per doz., $....
Half gal. cans.....per doz., ...
One gal. cans.....per doz., ...
Five gal. kits.....per doz., ...

COAL TAR

Refined, 5 gal. kits.....each, $....
Refined, 50 gal. barrels.....each, ...
Crude, 50 gal. barrels.....each, ...

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OILS AND GREASES

MARINE LUBRICATING OILS AND GREASES

Vacuum Oil Co.'s

	Bbls.	½ Bbls
Vaco No. 600 Cylinder oil	$....	....
Vaco No. 1 Marine Engine oil		....
Vaco Arctic Engine oil	....	....
Vaco Crank Case oil	....	....
Vaco Colza Burning oil "B"	....	....
Vaco Dynamo oil	....	....
Vacuum Telemotor oil	....	....
Polar Ice Machine oil	....	....
Vacuum Tunnel grease	....	....
Vacuum Anti-Friction grease		
.....25 lb. cans, $....		

Standard Oil Co.'s

	Bbls.	½ Bbls
Dark Marine Valve oil	$....	....
Dark Cylinder oil	....	....
Marine Dynamo Engine oil	....	....
Marine Auxiliary Engine oil	....	....
Dark Lubricating oil	....	....
Storm oil	....	....
Marine Lubricating oil	....	....
Marine Lubricating oil....25 lb. cans, $....		
Marine Lubricating oil....50 lb. cans,		....
Seacock Filler.....50 lb. cans,		....

	Bbls.	½ Bbls
300° Mineral Seal oil	....	....
Telco oil	....	....

ALBANY GREASE

No. 0 very soft, Nos. 1 and 2 soft, No. 3 medium, No. X extra hard.

Pails	5 lb.	10 lb.	25 lb.
Per lb.	$....	....	....

LARD OIL

	Bbls.
Extra Winter Strained	$....
Extra No. 1	....
No. 1	....

All guaranteed 100% pure, no adulteration of any kind.

SCREW CUTTING OIL

20% Lard oil and 80% White Lard oil properly compounded.

Bbls.	$....
Half bbls.	....

CHAIN AND CABLE GREASE

Bbls. ....

GASOLINE MOTOR OIL

Cans	1 gal.	5 gal.
Polarine, light	$....	....
Polarine, medium	....	....
Polarine, heavy	....	....
Mobile A	....	....
Mobile B	....	....

KEROSENE

	Bbls.
150° Water White	$....
Ohio State test	....
175° Headlight	....

GASOLINE

	Bbls.
74° to 76°	$....
63°	....

NAPHTHA

	Bbls.
Varnishmakers and Painters	$....

WHITE NEUTRAL OIL

Per bbl. .....$....

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PAINTS, VARNISHES, ETC.

U-W MARINE PAINTS

Absolutely Pure

Ready mixed, whites and tints.....
.....per gal., $....
Ready mixed, whites and tints.....
.....per ½ gal., ...
Marine black .....per gal., ...
Blue, orange and green.....per gal., ...
Vermilion .....per gal., ...
Signal red .....½ pint cans, ...
Signal green.....½ pint cans, ...
Enamel paints.....per gal., ...

COPPER AND BOTTOM PAINTS

Sherwin-Williams Co.

	1s	½s	¼s
Brown copper paint.....	$....	....	....
Green copper paint.....	....	....	....
Red copper paint.....	....	....	....
Corinthian green.....	....	....	....
Anti-Fouling bronze.....	....	....	....

New Jersey Paint Works

	1s	½s	¼s
Copper bronze composition.	$....	....	....

Geo. Kirby Jr. Paint Co.

	1s	½s	¼s
Brown composite	$....	....	....
Green composite.....	....	....	....
Red composite.....	....	....	....

Copper bronze New Bedford Anti-Fouling bronze .....
Fire Red New Bedford Anti-Fouling bronze .....
Green New Bedford Anti-Fouling bronze .....

Anti-Fouling bronze is put up, liquid and powder in separate packages and when mixed makes one quart.

VALSPAR BRONZE BOTTOM PAINT

Quart cans only.....per gal., $....

HOLZAPFEL'S YACHT BOTTOM COMPOSITE

	1s	½s	¼s
Red copper.....	$....	....	....
Green copper	....	....	....
Brown copper	....	....	....
New metallic bronze.....	....	....	....

SPAR AND YACHT VARNISH

We can furnish promptly any standard make of Spar or finishing varnish.

Information and prices on request.

OILS

Raw or boiled linseed.....per gal., $....
Turpentine .....per gal., ...
Japan dryer .....per gal., ...
Turpentine dryer .....per gal., ...

PAINT AND VARNISH REMOVER

Per gallon .....$....

ENGINE ENAMELS

Black or maroon.....per gal., $....
White, yellow or green.....per gal., ...
Vermilion .....per gal., ...

PURE WHITE LEAD—IN OIL

12½ lb. kegs.....½c advance
1, 2, 3 and 5 lb. cans, per lb.....$....
100 lb. kegs..... ....
25 and 50 lb. kegs.....¼c advance

WHITE ZINC—IN OIL (RED SEAL)

Strictly pure, in 1, 5, 12½ and 25 lb. cans .....per lb., $....

PURE RED LEAD—DRY

100, 50 and 25 lb. kegs.....per lb., $....

LIQUID GOLD

Quarts .....$....
Pints ....

ALUMINUM

Pints .....$....
½ pints ....
¼ pints ....
Gallons ....
½ gallon ....
¼ gallon ....

BRONZING POWDER

Gold .....1 lb. cans, $....
Gold .....oz. papers, ...
Aluminum .....1 lb. cans, ...

BRONZING LIQUID

Gallon .....$....
½ gallon ....
¼ gallon ....
⅛ gallon ....

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GLUE

JEFFREY'S PATENT MARINE GLUE

Guaranteed to Be Waterproof

Its peculiar properties are those of flexibility and durability, and although it becomes soft and pliant under heat, it still retains its adhesion to timber, fiber, etc., and is clean and insoluble in water.

No. 1 Black, White or Yellow Yacht Glue

Extra Quality. Also Mahogany Color

For Deck and Hull Seams of Yachts and Boats

1 Lb.	2 Lb.	3 Lb.	5 Lb. Cans	14, 28, 56, 112 Lb. Boxes
$0.40	$0.80	$1.15	$1.85 each	$0.35 per lb.

No. 2 Black, White or Yellow Ship Glue

First Quality

For Deck and Hull Seams of all Classes of Vessels

1 Lb.	2 Lb.	3 Lb.	5 Lb. Cans	14, 28, 56, 112 Lb. Boxes
$0.35	$0.65	$0.90	$1.50 each	$0.25 per lb.

No. 3 Black, White or Yellow Special "Navy"

For Deck and Hull Seams

1 Lb.	2 Lb.	3 Lb.	5 Lb. Cans	14, 28, 56, 112 Lb. Boxes
$0.25	$0.50	$0.70	$1.15 each	$0.20 per lb.

No. 7 Black, White or Yellow Glue

Soft Quality. For Waterproofing Canvas

Used largely by manufacturers of Knock Down Boats.

Also used in combination with canvas for decks and canvas boats and canoes, and in combination with calico for sponsons.

1 Lb.	2 Lb.	3 Lb.	5 Lb. Cans	14, 28, 56, 112 Lb. Boxes
$0.40	$0.80	$1.15	$1.85 each	$0.35 per lb.

TWENTIETH CENTURY GLUE CEMENT

Twentieth Century Glue Cement Ready for Use

Waterproof. Not Affected by Heat or Cold. Marine Grade

For attaching cork, canvas, felt, oilcloth, rubber, leather and linoleum to iron, steel, wood or stone. Especially adapted for attaching canvas and linoleums to wooden or steel decks; asbestos to brick and stone; tiles to Portland cement; repairing stone and crockery ware, granite, marble and terra cotta.

A Grade for attaching linoleum to cement floors.

B Grade for attaching linoleum to wooden floors.

	½ Pints	Pints	Quarts	½ Gals.	Gals.
Grade A .....each,	$0.35	.60	1.10	2.10	4.00
Grade B .....each,	.25	.40	.75	1.35	2.50

SPECIAL MARINE CANOE GLUE

Black, White and Yellow

Best Filler for Canvas

Our 25c emergency can made a big hit. Every canoeist should carry one; it is as valuable to him as a repair kit to a bicyclist or automobilist. It is a Johnnie-on-the-spot article that no boatman should be without. Sent by mail on receipt of 30 cents in stamps.

Emergency Box	1 Lb.	2 Lb.	3 Lb.	5 Lb. Cans	14, 28, 56, 112 Lb. Boxes
$0.25	.60	1.00	1.40	2.25	$0.40 per lb.

WATERPROOF LIQUID GLUE

C Quality

For attaching cork, oilcloths, canvas, rubber, leather and linoleum to iron, steel and wooden decks.

¼ Pints	½ Pints	Pints	Quarts	½ Gals.	Gals.	5 Gal. Cans
$0.35	.45	.80	1.45	2.80	5.30	4.65 per gal.

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GLUE AND CEMENT

MARINE GLUE THINNER

For Thinning Only

½ Pints	Pints	Quarts	½ Gals	Gal. Cans
$0.35	.60	1.10	2.10	4.00 each

JOINT SOLUTION

For Uniting Surfaces of Glue in Jointing Spars, etc.

¼ Pints	½ Pints	Pints	Quarts	½ Gals.	Gal. Cans
$0.35	.45	.80	1.45	2.80	5.30 each

Full directions as to uses for which it is intended and method of melting and applying on each can. When ordering always give numbers and colors, and state the use for which it is intended.

H. B. FRED KUHL'S ELASTIC SEAM COMPOSITION

	1, 2 or 5 Lb.	12½, 25, 50 or 100 Lb.
White, gray, yellow or black	$0.19	$0.16
2-lb. Trial package with seam paint	....	.50
5-lb. Trial package with seam paint	....	1.25

Seam paint.....Gals., $2.00 ½ Gals., $1.10 Quarts, $0.60 Pints, $0.40

To secure the best results 1 gallon of Elastic Seam Paint should be used with each 100 lbs. of Elastic Seam Composition.

ELASTIC GLAZING COMPOSITION

For bedding and glazing in general, skylights, conservatories, pointing up stonework, etc., in fact in all places where a tight joint is required. The Elastic Glazing Composition adheres readily to galvanized and raw iron, steel, wood, glass, stone, concrete, etc. Never becomes very hard, always remaining elastic and flexible and thereby preventing glass from cracking.

Made of the best procurable material that withstands the extreme heat and cold, as well as rain, fog, etc., without chipping or peeling off.

The color is light gray, but in large quantities can be made in any shade.

Is put up in 12½, 25 and 50-pound kegs, and 800-pound barrels.

Per pound $0.12
2 and 5-pound cans, per pound..... .15

ELASTIC TROWEL CEMENT

For cementing of steel and iron hulls, furring up of rivet heads, etc. Works very easily under the trowel; dries hard in 4 hours to allow of second coat or sandpapering, yet remains sufficiently elastic to prevent it from cracking, chipping or peeling off.

The White Trowel Cement is pure white, and for patch work; saves three or four times touching up, besides one full coat of white paint.

For cement paints, thin with equal parts of turpentine.

Put up in 1, 5 and 10-gal. packages.

"It will stick."

Gray .....per gallon, $3.00
White .....per gallon, 3.50

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CHEMICALS AND SOAPS

SAL SODA
Granulated in 300 lb. bbls...per lb....$....

SODA ASH
48% in 324 lb. bbls.....per lb., $....

BICARBONATE OF SODA
For Fire Extinguishers
1½ lb. pkgs.....per lb., $....
100 lb. kegs.....per lb., ...

SAL AMMONIAC
Granulated in 100 lb. kegs....per lb., $....
Lump in 100 lb. kegs.....per lb., ...

SALT
No. 2 280 lb. bbls.....per bbl., $....

CARBON TETRACHLORIDE
For Fire Extinguishers
In drums.....per lb., $....
In bulk.....per lb., ...

ANHYDROUS AMMONIA
In 30 lb. steel bottles.....each, $....

CARBON DIOXIDE
In 30 lb. steel bottles.....each, $....

SULPHURIC ACID
For Fire Extinguishers
4 oz. bottles.....per doz., $....

SULPHUR CANDLES
1 doz. in carton with tin pan.per case, $....

WEST'S DISINFECTANT

Cans, gal.	1	5	10	25
Each	$....	....	....	....

SANI FLUSH
1 lb. cans.....per doz., $....

IVORY SOAP
Small size, 100 cakes in a box.per doz., $....
Large size, 100 cakes in a box.per doz., ...

LAKESIDE SOAP
5 dozen cakes in a box.....per doz., $....

LILY WHITE SOAP
100 cakes in a box.....per doz., $....

PUMISOAP
100 cakes in a box.....per doz., $....

FLASH HAND SOAP
14 oz. cans.....per doz, $....

SAPOLIO
72 cakes in a box.....per doz., $....

BON AMI
50 cakes in a box.....per doz., $....

LINSEED OIL SOAP

Size pails, lbs.	5	10	25	Bbls.
Per lb.	$....	....	....	....

SOFT SOAP
25 lb. kegs.....$....
50 lb. bbls. ....

DUTCH CLEANSER
1 lb. cans.....per doz., $....

SOAPINE
1 lb. pkgs.....per doz., $....

GOLD DUST
1 lb. pkgs.....per doz., $....

S. P. CONCENTRATED LYE

Cans, lb.	½	1	5
Each	$....	....	....

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SOAPS AND SOAP JARS

HARVARD SOAP POWDER

Work Easy

For scrubbing painted surfaces, decks, linoleums, floors, etc., also for washing dishes, linens, woolens and flannel goods.

A fine soft soap is made by dissolving one half the contents of the package of Harvard Work Easy Soap Powder in a three gallon pail of hot water.

3 lb. cartons; 24 in a case....per doz., $....
200 lb. barrels.....per pound ....

HARVARD OIL SOAP

This is a potash soap containing no free alkali, making it perfectly neutral, therefore suitable for anything needing cleansing with soap and water. Will remove dirt and grease from painted and varnished surfaces, without injuring the paint or varnish in any way, and will leave a finish equal to furniture polish on these surfaces.

For use in the home, on board ship, in the office, the store, the factory, the school, church, club or hospital.

HARVARD LIQUID SOAP

The most sanitary and economical soap for both public and private use.

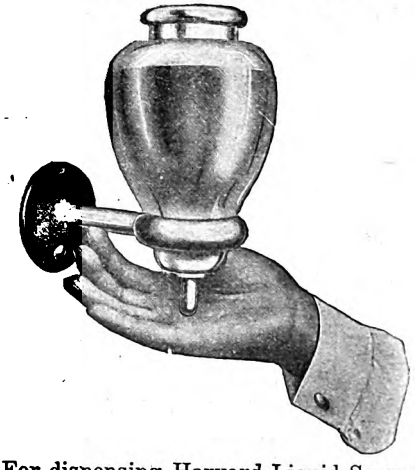
No danger of infection from other people who have skin or blood disease, as is the case when bar soap is used in common. Contains only the ingredients necessary to make it a perfectly satisfactory cleansing soap.

Will not harm the softest or tenderest skin and will prevent the hands from cracking and chapping in cold weather.

Works like magic without very much scrubbing or trouble in removing dirt, oil and grease from the hands of automobilists, mechanics, engineers, oilers, firemen, also captains, mates, watchmen, wheelsmen, stewards, deckhands, etc.

	Per Gallon
Barrels	$....
½ Barrels	....
¼ Barrels	....
10 Gallon cans	....
5 Gallon cans	....
1 Gallon cans (1 or 6 in case)	....

HARVARD SOAP JARS



For dispensing Harvard Liquid Soap. The most sanitary and economical way. Gives 6,000 to 8,000 washes, per gallon.

Each $3.00

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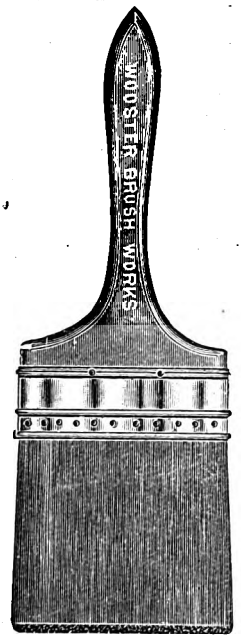
BRUSHES

WALL BRUSHES

Euclid and Cedar



Ohio

Euclid

Nickel plated ferrule, natural varnished handle, selected black bristles.

Width, in...	2½	3	3½	4	4½	5
Each.....$....	....	....	....	....	....	....

Cedar

Nickel plated ferrule, natural polished handle, black Chinese bristles.

Width, in.	4	4½
Each .....$....	....	....

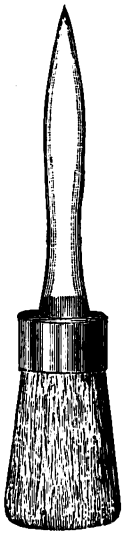
Ohio H

Long selected black Chinese bristles; nickel ferrules, red polished beaver tail handle.

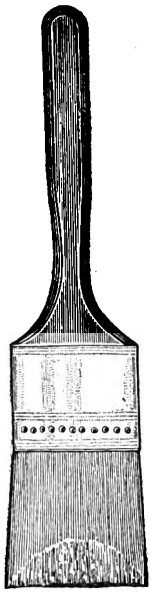
Width, in.	3½	4	4½
Length bristles, in.....	3½	3¾	4
Each .....$....	....	....	

PAINT AND VARNISH BRUSHES

Buckeye Oval



Klondike



Buckeye Paint or Varnish

Oval, chisel, black Chinese bristles, nickel plated ferrules, beaver tail handle.

Nos.	10	14	20
Length bristles, in.....	2½	3	3¾
Each .....$....		....	....

Klondike Varnish

Flat chisel, black Chinese bristles, tin bound, yellow handle, cement set.

Width, in.	1	1½	2	2½	3
Each .....$....	....	....	....	....	....

XX Varnish

Chisel, black Chinese bristles, nickel bound, double thick.

Width, in.	1	1½	2	2½	3
Each .....$....	....	....	....	....	....

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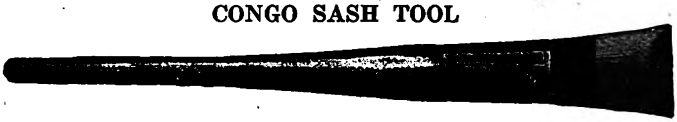
BRUSHES

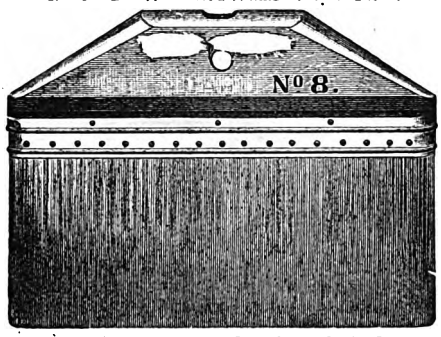
CONGO SASH TOOL



Flat chisel, black Chinese bristles, nickel ferrules, polished wood handle.

Nos.	1	4	5	6	8
Each	$....	....	....	....	....

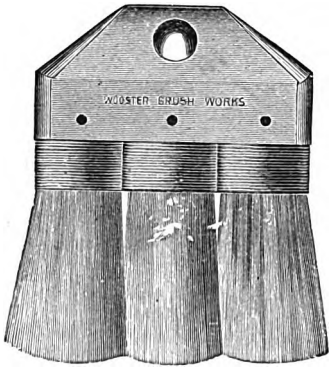
GLOBE WHITEWASH BRUSH



Imitation brass bound, white bristles outside, mixed center, varnished block.

No.	7
Width, in.	9
Each	$....

ROOF BRUSHES



Climax

Mixed center, grey bristles outside.

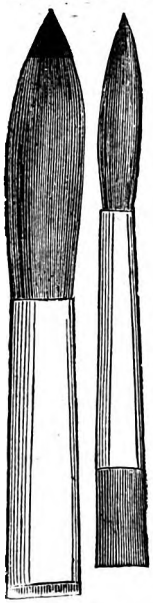
Knots	3	4
Each	$....	....

C. B.

Mixed center, black bristles outside.

Knots	3	4
Each	$....	....

MARKING BRUSHES



Extra quality, black bristles, natural wood handle.

Nos.	2	4	6
Each	$..	....	....

Nos. 2, 4, 6 Assorted, one gross in a box .....per gross, $....

SHIP SEAM BRUSHES

Brass wire drawn, 5 in.....each, $....

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BRUSHES

CAR WINDOW BRUSH

Solid red polished block, two handle holes, staple set, flat face.

No.	38
Length hair, in.	2½
Diam. block, in.	4¾
All black hair.....per 100,	$150.00

Handles

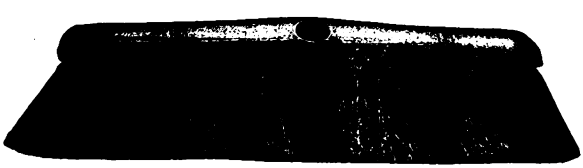
Length, ft.	6	8
Per 100	$20.00	28.00

COUNTER OR BENCH DUSTER

Solid natural polished handle, staple set, extra stiff, pure black hair.

No.	428
Length over all, in.	10
Length of hair, in.	2⅞
Per 100	$130.00

FLOOR BROOMS



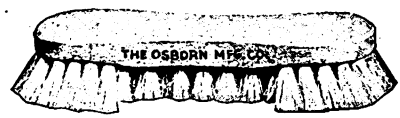
Solid natural polished blocks, polished handle, staple set oval face, gray fibre center, black hair casing.

No. 4 14 inch, length hair 2⅝ in... .....per 100, $150.00

Solid red blocks, two threaded handle holes, polished handle, staple set, oval face. All black stiff horse hair.

No. 24 14 in., length hair 2⅝ in..... .....per 100, $225.00

POINTED END SCRUB



White tampico 5 row, solid block, staple set.

No. 601 9 in. block .....per 100, $22.00

SQUARE END SCRUB

White tampico, 5 rows, solid block, staple set.

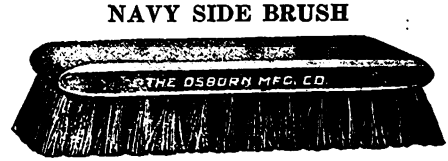
No. 652 8¼ in. block .....per 100, $21.00

DECK BRUSH AND SCRAPER

Rice root, 6 rows, solid block, staple set, rubber scraper.

No.	363
Size block, in.	10x3
Length fibre, body, in.	1⅛
Length fibre, wings, in.	1½
Per 100	$115.00

NAVY SIDE BRUSH



No. 256 Solid block, size 2⅝x8¼ in.; white Tampico fibre, length 1 in., five rows, staple set.....per 100, $21.00

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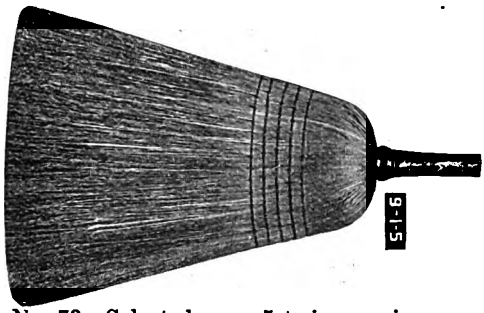
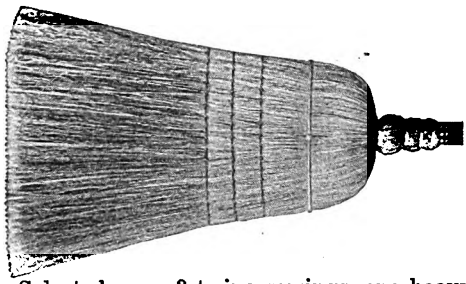
BROOMS

CABIN BROOMS



No. 73 Selected corn, 5 twine sewings, weight per dozen 28 lbs..per 100, $120.00

DECK BROOMS

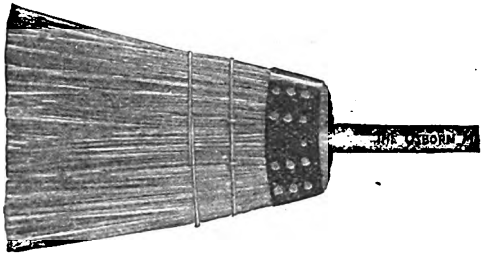


Selected corn, 3 twine sewings, one heavy wire sewing.

No. 42 Weight per doz., 30 lbs.....
.....per 100,.$110.00

No. 46 Weight per doz., 36 lbs.....
.....per 100, 140.00

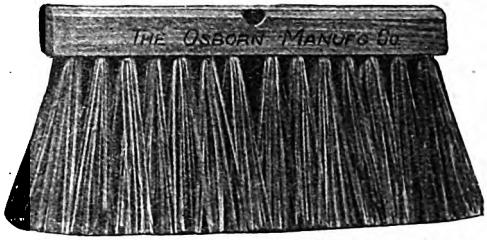
WAREHOUSE AND MILL BROOMS



Round rattan, nailed steel head, wire sewed, hardwood handle.

No. 226 Weight per doz., 27 lbs.....
.....per 100, $100.00

STANDARD RATTAN PUSH BROOMS



Selected round rattan, solid block, length of fibre 6 in., 4 rows wide.

Nos.	271	273
Size block, in.	14x3	18x3
Per 100	$95.00	125.00

DOCK BROOMS

Mixed bassine, solid block, length stock 4 inches, 6 rows wide.

No. 695 Block 10⅞x2¾ in. .....
.....per 100, $54.00

STEEL WIRE PUSH BROOMS

Tempered flat steel wire, length of stock 5 in., 4 rows wide.

Nos.	120	121	122
Size block, in.	12x2⅜	14x2⅜	16x2⅜
Per 100	$60.00	70.00	80.00

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BRUSHES, MOPS, ETC.

CASTING BRUSHES

Tempered flat steel wire, five wires doubled per hole.

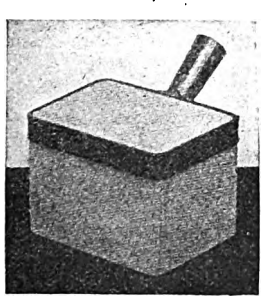
Nos.	4	7
Number of rows	4x10	5x10
Length of stock, in.	5	4
Size block, in.	7¾x2¼	7¾x2⅝
Per 100	$40.00	45.00

SQUILGEES

Square corners, finished hardwood blocks, $\frac{3}{16}$x1⅛ inch rubber scrapers.

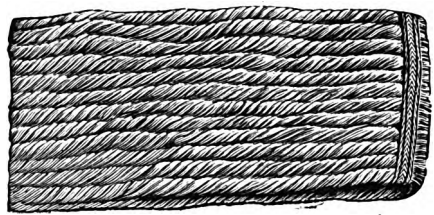
Length, in.	14	16
Per 100	$65.00	70.00

HOLYSTONES



With band 5½x6x8 ..... each, $2.00
Without band 5½x6x8 ..... each, 1.00
Hand 3½x4x8 ..... each, .75

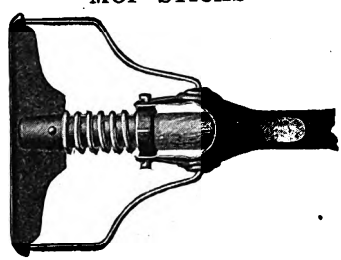
MOPS



Long looped end cotton strands.

Weight each, oz.	8	10	16	20
Per doz. $	...	...	...	...

MOP STICKS

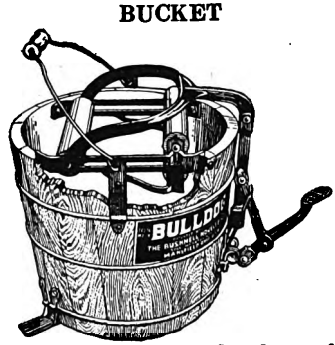


Tempered steel springs, heavy wood handle, coppered finish....per doz., $1.50

SPONGES

Sheepswool forms or cuts ...per lb., $....
Florida yellow .....
.....per lb., ...

BULLDOG MOP WRINGER AND BUCKET



Selected cypress pail, hard maple rolls, malleable castings.
Standard, 14 quart.....per doz., $....
Large, 22 quart .....per doz., ...

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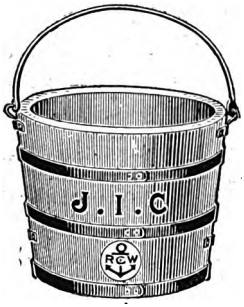
PAILS, TUBS, ETC.

J. I. C. PAILS



Made of selected oak or cedar timber varnished, heavily ironed. The strap ear runs down side of bucket, fits over hoops and laps under stave at bottom, fastened with iron rivets.

Oak, galvanized iron .....per doz., $....
Cedar, galvanized iron ....per doz., ...

ARMY PAILS

Selected white pine.

Galvanized hoops .....per doz., $....
Brass hoops .....per doz., ...

FIRE-PAILS

Galvanized, plain, round bottom.

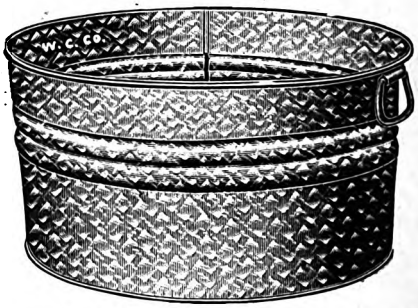
Nos.	212	214
Capacity, qts.	12	14
Per doz.	$7.95	8.80

WATER PAILS

Galvanized

No. 142 14 qt. regular ....per doz., $6.90
No. 514 14 qt., extra heavy.per doz., 11.60

WASH TUBS



Heavy galvanized iron with drop handles.

No. 2 22¾x19½x11 in. ..per doz., $18.00

WASH TUB COVERS

Galvanized iron covers for above.....
.....per doz., $....

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TINWARE, KETTLES AND LADLES

WOOD JACKET CANS

Cone Top

Tin can with bail, opening for cork.

Capacity Gals.	Each
1	$....
2	....
3	....
5	....
10	....

Flat Top

Tin can with handle, opening for cork.

Capacity Gals.	Each
1	$....
2	....
3	....
5	....
10	....

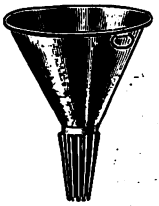
TIN MEASURES

Capacity	Each Tin
1 Pt.	$....
1 Qt.	....
2 Qt.	....
1 Gal.	....

Heavy Copper Plated

Capacity	Size, In.	Each
1 Pint	3½x4¼	$....
1 Quart	4⅛x5¾	....
2 Quart	5⅜x7½	....
1 Gal.	6½x9¼	....

FUNNELS



Capacity	Tin Each	Copper Each
1 Pint	$....	....
1 Quart	....	....
2 Quart	....	....
1 Gal.	....	....
2 Gal.	....	....

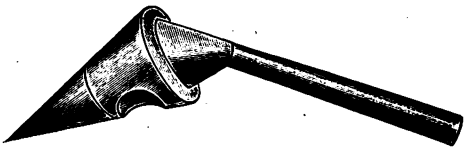
Galvanized

Two quart, 5 inch, with fine brass strainer, fluted spout, fits 1 inch pipe .....each, $....

PITCH KETTLES

No. 9. 10 quart .....each, $....

PITCH LADLES



Heavy tin .....per doz., $....

MALLEABLE IRON MELTING LADLES

Size, in.	2½	3	4	5	6
Each	$...	...	...	...	...

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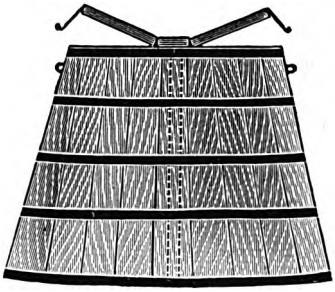
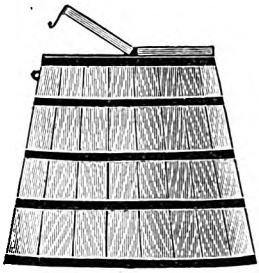
BUTTS, PAIL RACKS AND SOUNDING RODS

HARNESS BUTTS OR CASKS



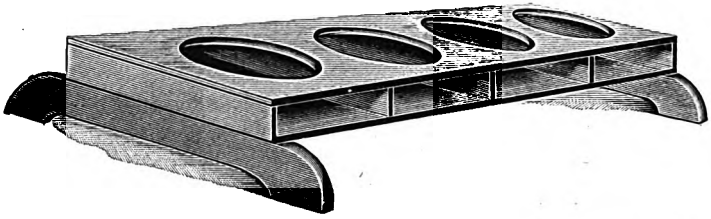
Made usually in form of a frustum or cone. Fastened to the deck of a vessel to receive the salt beef and pork for daily consumption. Also called harness tub. Made to order only. Write for prices giving complete specifications.

SCUTTLE BUTTS OR WATER CASKS



A cask or butt having a scuttle or hole cut in it for the introduction of a cup or dipper. Used to hold drinking water. Made to order only. Write for prices, giving complete specifications.

FIRE PAIL RACKS



No. holes	2	3	4	5	6	7	8	10	12
Each	$....	....	....	....	....	....	....	....	....

SOUNDING RODS

Length, feet	2½	3	4	5	6	7
Each	$....	....	....	....	....	....

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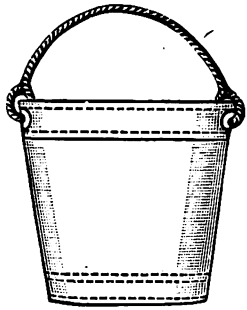
PAILS, CUPS, BREAKERS, ETC.

CANVAS PAILS

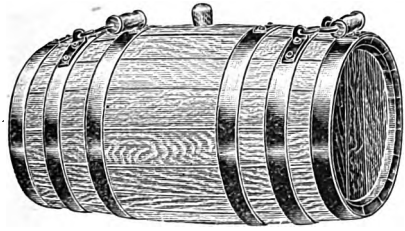


Light, canvas bottom.....per doz., $....
Heavy, wooden bottom.....per doz., ...

DRINKING CUPS

Nos.	8	9	10
Capacity, pints	½	¾	1
Per doz.	$2.00	2.25	2.50

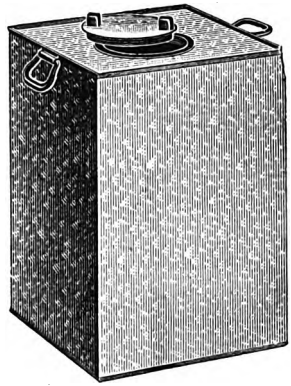
WATER BREAKERS



Best oak staves, wood handles.

Capacity	Galv. Hoops	Brass Hoops
5 gallons	$....	....
10 gallons	....	....
15 gallons	....	....
20 gallons	....	....
50 gallons	....	....

BREAD BREAKERS



Standard government pattern for life boats. Galvanized iron with cast brass cap.

Capacity	Each
16 pounds	$....
25 pounds	....
30 pounds	....
35 pounds	....
40 pounds	....
50 pounds	....
60 pounds	....
75 pounds	....

U. S. ARMY RATION

Conforms to U. S. Steamboat Inspection Service. Contents as follows:

Chocolate liquor	47.45%
Nucleo casein	7.27%
Malted milk	7.27%
Egg albumen	14.55%
Cane sugar	.82%
Cocoa butter	3.64%
Moisture	3. %

One ration in tin can.....per doz., $....

CREW BREAD

This crew bread or sea biscuit is made in accordance with U. S. Steamboat Inspection Regulations.

Prices on application.

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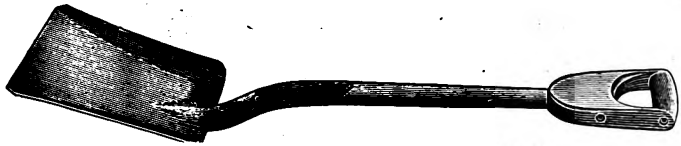
SHOVELS AND SCOOPS

D HANDLE SQUARE POINT SHOVEL

Crucible Steel, Plain Back

Nos.	91	92	93	94
Size	2	3	4	5
Size blade, inches	9¾x12	10x12	10¾x13	11¼x13½
Per dozen	$....	....	....	....

ORE SHOVELS

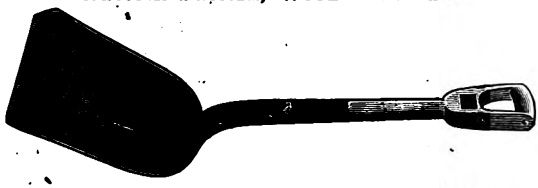


Crucible Steel, Socket Strap, Plain Back

Size, Nos.	2	3
Size blade, inches	9¾x12	10¼x12¼
Per dozen	$....	....

COAL SCOOPS

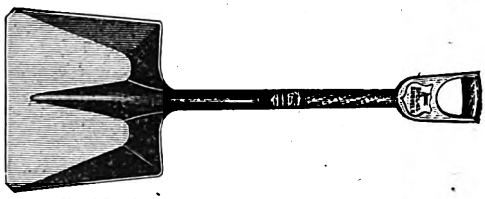
Eastern Pattern, Wood D Handle



Cast Steel, Hollow Back, Socket Strap

Size, Nos.	4	5	6
Size blade, inches	11½x16	11¾x16½	12¾x16¼
Per dozen	$....	....	....

COAL SHOVELS



Solid Cast Steel, Hollow Back

Size, Nos.	2	3
Size blade, inches	14¼x14¾	14¾x15¼
Per dozen	$....	....

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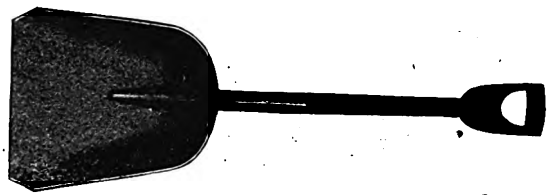
GRAIN SCOOPS, SNOW AND FIRE SHOVELS

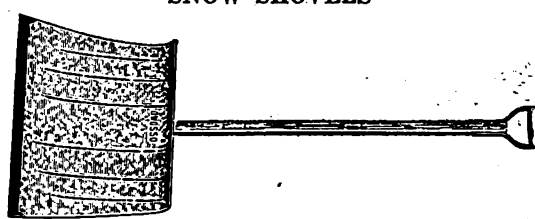
GRAIN SCOOPS



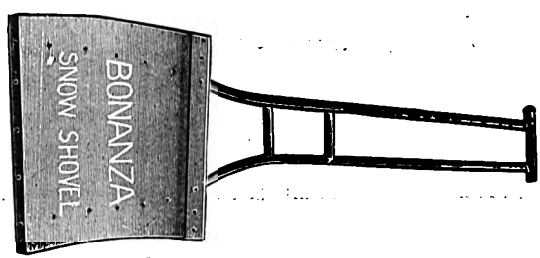
Cast Steel, Hollow Back, D Handle

Size, Nos.	6	7	8	10
Size blade, inches	13½x16	14x16½	14¼x17¼	15x18½
Per dozen	$....	....	....	....

SNOW SHOVELS



No. 33 Heavy galvanized steel, corrugated and wired 14 gauge angle iron braces on back, oak handle, steel D; size of blade 17x15½ inches.....per dozen, $....



No. 35 Bonanza, three ply maple put together with waterproof glue, flat steel point bent hardwood handles, 24x19 in.....per dozen, $....

FIRE SHOVELS

IXL Stamped sheet steel, double steel handle, riveted, with eye, length over all 22 inches, size scoop 5⅛x8¾ inches.

No. 2 Japanned .....per dozen, $....

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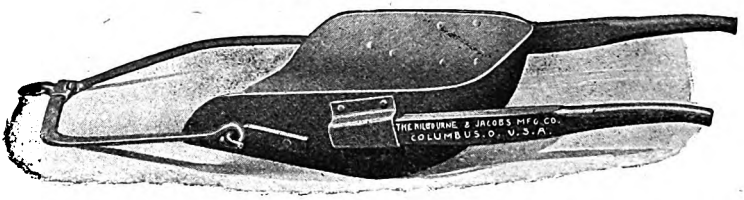
SCRAPERS, WHEELBARROWS AND FIRING TOOLS

DRAG SCRAPERS



Stamped steel, seamless tray, bails of heavy special steel, extra rigid, with swivel.

No.	Capacity Cu. Feet	Length Tray Inches	Width of Tray Inches	Depth of Tray Inches	With Runners Each	Without Runners Each
1	7	34	33	10	$....	$....
2	5	31½	29½	9½	....	....
3	3	32	26	9½	....	....

WHEELBARROWS

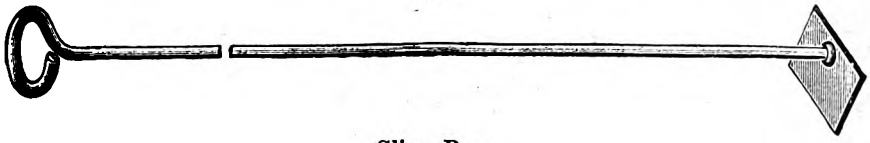
Tubular Steel

Steel tray, tubular steel frame, heavy channel steel legs and braces, malleable axle bearings. Painted black.

No.	Capacity Cu. Feet	Size Top Inches	Height Inches	Each
4	3	29 x32	19½	$....
5	4	28½x35½	21½	....

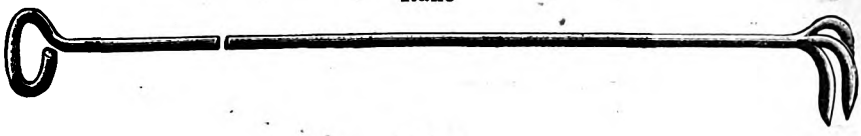
FIRING TOOLS

Hoe

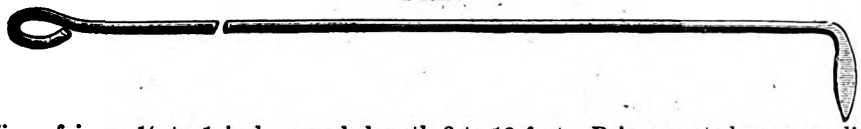


Slice Bar

Rake



Poker



Size of iron, ½ to 1 inch, round, length 3 to 12 feet. Prices quoted upon application.

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TUBING, WIRE CLOTH, ETC.

BRASS AND COPPER TUBING

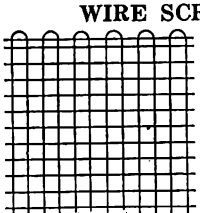
Iron Pipe Sizes

Extras Over Base Price Brass Tubes

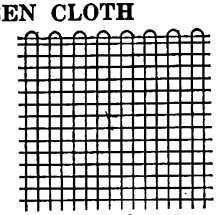
Iron pipe size, inches.....	⅛	¼	⅜	½	¾	1	1¼	1½	2
Price per lb.....	$0.08	.07	.02	.01		Base Price			
Weight, brass, per ft., lbs...	.25	.43	.62	.9	1.25	1.7	2.50	3	4
Weight, copper, per ft., lbs..	.26	.43	.62	.90	1.25	1.70	2.50	3	4
Iron pipe size, in.	2½	3	3½	4	4½	5	6	7	8
Price, per lb.	Base Price		.01	.02	.04	.06	.07	.09	.11
Weight, brass, per ft., lb....	5.75	8.3	10.9	12.7	13.9	15.75	18.31	26.28	29.88
Weight, copper, per ft, lb...	6.04	8.72	11.45	13.33	14.60	16.54	19.23	27.6	31.37

For price of copper tubes add 4 cents per pound to price of brass tubes.

WIRE SCREEN CLOTH



12 Mesh



16 Mesh

12, 14, 16 Mesh Galvanoid

Widths, 18 to 42 in.....per sq. ft., $....

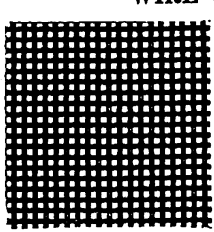
12, 14, 16 Mesh Galvanized

Widths 18 to 42 in.....per sq. ft., $....

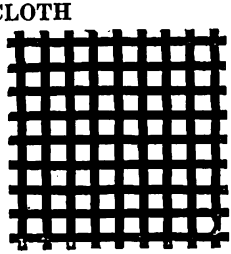
12, 14, 16 Mesh Painted

Widths 18 to 42 in.....per sq. ft., $....

WIRE CLOTH



18 Mesh

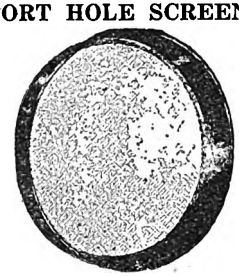


8 Mesh

We are prepared to furnish wire cloth of any mesh in black, galvanized, brass, bronze or copper, in any length or width.

Prices on application.

PORT HOLE SCREENS

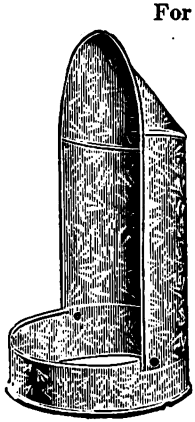


Copper Wire Cloth

Diam., in.	3	4	5	6	7
Each	$0.75	.85	1.00	1.20	1.40
Diam., in.	8	9	10	12	
Each	$1.60	1.80	2.00	2.25	

AIR SCOOPS OR WINDJAMMERS

For Port Holes



Diam. Inches	Copper or Brass Each	Galv. Each
3	$2.40	$1.20
4	2.80	1.40
5	3.20	1.60
6	3.60	1.80
7	4.00	2.00
8	4.40	2.20
9	4.80	2.40
10	5.20	2.60
12	6.00	3.00

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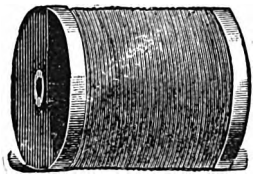
METALS AND WIRE

BAR SOLDER

Warranted half and half.....per lb., $....

WIRE SOLDER



For Electrical and Other Small Work
Half and half wire solder....per lb., $....

BABBITT METAL

Phoenix, superior quality....per lb., $....
No. 4 For ordinary shop use, per lb., ...

ANTIMONY

In 35 to 40 Lb. Cakes
Per lb. .....$....

SLAB ZINC OR SPELTER

In Slabs Weighing 40 to 50 Pounds
Per lb. .....$....

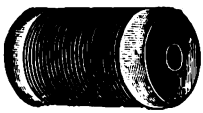
PIG TIN

100 lb. pigs.....per lb., $....

PIG LEAD

100 lb. pigs.....per lb., $....

LEAD WIRE



Diam., in.	$\frac{1}{32}$	$\frac{1}{16}$
One pound spools.....	$1.00	.50

SPOOL WIRE

Soft Copper Wire

Gauges	16	17	18	19	20
Per doz. spools..$...	...	...	...	...	...

Soft Brass Wire

Gauges	16	17	18	19	20
Per doz. spools..$...	...	...	...	...	...

ANNUNCIATOR WIRE

Single Conductor, All Colors

Gauges	14	16	18	20
Per lb. .....$...	...	...	...	...

On 1 lb. or 8 lb. spools

WEATHERPROOF LAMP CORD

No. 16 B. & S. gauge reinforced portable cord with saturated weatherproof braid.
Per foot .....$....

RUBBER COVERED WIRE

Solid Copper Conductor

B & S Gauge	Diam. Wire Mils	Diam. Over All, Inches	Weight Per 100 Ft., Lb.
8	1285	19/64	85
10	1019	17/64	60
12	0808	16/64	44
14	0640	14/64	34
16	0508	3/16	20
18	0403	11/64	16
20	0319	9/64	14

Price on application.

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SHEET METALS

SOFT PLAIN BRAZIERS' COPPER

In Sheets 30x60 Inches

Stubs wire gauge, No. 32	30	28	27	26	26	25	24	23	22	21
Weight per sheet, lb... 6	7	8	9	10	11	12½	15	16	18	20
Weight per sq. ft., oz.. 8	9	10	12	12	14	16	18	20	24	26
Per pound										$....

Stubs wire gauge, No.....	19	18	17	16	15	14	13	12	11	10
Weight per sheet, lb.....	25	30	35	40	45	50	60	65	70	80
Per pound										$....

SHEET BRASS

(In Rolls)

B. & S. Gauge

6 in. wide, Nos. 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36.
8 in. wide, Nos. 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28.
10 in. wide, Nos. 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30.
12 in. wide, Nos. 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30.
18 in. wide, Nos. 18, 20, 22, 24, 26.
Per pound ..... $....

SHEET ZINC

In Rolls

Nos.	6	7	8	9	10	11	12	13	14	15
Weight, per sq. ft., lbs.....	.45	.52	.60	.67	.75	.90	1.05	1.20	1.35	1.50
Thickness, inches	.012	.014	.016	.018	.020	.024	.028	.032	.036	.040
Per pound										$....

SHEET LEAD

Rolls 2½ to 7 lb., 7½x24 ft. rolls 8 to 16 lb., 8x24 ft.

Thickness, inches	$\frac{1}{32}$	$\frac{3}{64}$	$\frac{1}{16}$	¼	½	$\frac{1}{16}$	⅛	$\frac{5}{32}$	$\frac{3}{16}$	$\frac{7}{32}$	¼
Pounds per sq. ft.....	2½	3	4	5	6	7	8	10	12	14	16
Per pound											$....

BRIGHT TIN PLATE

Charcoal Finish

	Inches	Conts. Lb. Per Box	Sheets Per Box	Weight Per Box, Lb.	Per Box
IC	14x20	4	112	107	$....
	20x28	8	112	214	....
IX	14x20	4	112	135	....
	20x28	8	112	270	....
IXX	14x20	4	112	155	....
	20x28	4	56	155	....

ROOFING TERNE

Charcoal Iron, 25 lb. Lead Coating

		Sheets Per Box	Weight Per Box	Per Box
IC	20x28	112	230	$....
IX	20x28	112	285 to 290	....

GALVANIZED SHEETS

No.	Size, Inches				
14	30x96,	36x96,	36x120		
16	30x96,	36x96,	36x120		
18	28x96,	30x96,	36x96,	36x120	
20	28x96,	30x96,	36x96,	36x120	
22	28x96,	30x96,	36x96,	36x120	
24	24x96,	28x96,	30x96,	36x96,	36x120
26	24x96,	28x96,	30x96,	36x96,	36x120
27	24x96,	28x96,	30x96		
28	24x96,	28x96,	30x96,	36x96,	36x120
30	24x96,	28x96,	30x96		

Per pound ..... $....

PHOTOGRAPHERS' TIN OR SQUEEGEE PLATES

10x14, 14x18, 18x24.....per lb., $....

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METRIC CONVERSION TABLE

Lineal Measure

MILLIMETERS AND INCH EQUIVALENTS

Millimeters	Decimal Inch Equivalent	Nearest Inch and Fraction Equivalent	Millimeters	Decimal Inch Equivalent	Nearest Inch and Fraction Equivalent
1	.03937	$\frac{1}{32}$	39	1.53543	$1\frac{17}{32}$
2	.07874	$\frac{5}{64}$	40	1.57480	$1\frac{9}{16}$
3	.11811	$\frac{7}{64}$	41	1.61417	$1\frac{39}{64}$
4	.15748	$\frac{5}{32}$	42	1.65354	$1\frac{41}{64}$
5	.19685	$\frac{3}{16}$	43	1.69291	$1\frac{11}{16}$
6	.23622	$\frac{15}{64}$	44	1.73228	$1\frac{45}{64}$
7	.27559	$\frac{17}{64}$	45	1.77165	$1\frac{49}{64}$
8	.31496	$\frac{5}{16}$	46	1.81102	$1\frac{13}{16}$
9	.35433	$\frac{11}{32}$	47	1.85039	$1\frac{27}{32}$
10	.39370	$\frac{25}{64}$	48	1.88976	$1\frac{57}{64}$
11	.43307	$\frac{27}{64}$	49	1.92913	$1\frac{59}{64}$
12	.47244	$\frac{15}{32}$	50	1.96850	$1\frac{31}{32}$
13	.51181	½	51	2.00787	2
14	.55118	$\frac{35}{64}$	52	2.04724	$2\frac{3}{64}$
15	.59055	$\frac{19}{32}$	53	2.08661	$2\frac{5}{64}$
16	.62992	⅝	54	2.12598	2⅛
17	.66929	$\frac{21}{32}$	55	2.16535	$2\frac{5}{32}$
18	.70866	$\frac{45}{64}$	56	2.20472	$2\frac{13}{64}$
19	.74803	¾	57	2.24409	$2\frac{15}{64}$
20	.78740	$\frac{25}{32}$	58	2.28346	$2\frac{9}{32}$
21	.82677	$\frac{53}{64}$	59	2.32283	$2\frac{5}{16}$
22	.86614	$\frac{55}{64}$	60	2.36220	$2\frac{23}{64}$
23	.90551	$\frac{29}{32}$	61	2.40157	$2\frac{25}{64}$
24	.94488	$\frac{15}{16}$	62	2.44094	$2\frac{7}{16}$
25	.98425	$\frac{63}{64}$	63	2.48031	$2\frac{15}{32}$
26	1.02362	$1\frac{1}{64}$	64	2.51968	$2\frac{33}{64}$
27	1.06299	$1\frac{1}{16}$	65	2.55905	$2\frac{35}{64}$
28	1.10236	$1\frac{3}{32}$	66	2.59942	$2\frac{19}{32}$
29	1.14173	$1\frac{9}{64}$	67	2.63879	2⅝
30	1.18110	$1\frac{11}{64}$	68	2.67816	$2\frac{43}{64}$
31	1.22047	$1\frac{7}{32}$	69	2.71753	$2\frac{23}{32}$
32	1.25984	1¼	70	2.75690	2¾
33	1.29921	$1\frac{19}{64}$	71	2.79627	$2\frac{51}{64}$
34	1.33858	$1\frac{21}{64}$	72	2.83564	$2\frac{53}{64}$
35	1.37795	1⅜	73	2.87501	2⅞
36	1.41732	$1\frac{13}{32}$	74	2.91438	$2\frac{29}{32}$
37	1.45669	$1\frac{29}{64}$	75	2.95375	$2\frac{61}{64}$
38	1.49606	$1\frac{31}{64}$	76	2.99312	$2\frac{63}{64}$

1 mm.=0.03937 in. or approximately $\frac{1}{32}$ in. 1 dc.= 3.937 in. or approximately $3\frac{15}{16}$ in.

1 cm. =0.3937 in. or approximately $\frac{25}{64}$ in. 1 m.= { 39.37 in. or approximately 39⅜ in.
3.28083 ft. or approximately $3\frac{3}{32}$ ft.

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METRIC CONVERSION TABLE

Lineal Measure

INCHES AND MILLIMETER EQUIVALENTS

Inches	Equivalent in Millimeters	Inches	Equivalent in Millimeters	Inches	Equivalent in Millimeters
1	25.40	18	457.20	35	889.00
2	50.80	19	482.60	36	914.40
3	76.20	20	508.00	37	939.80
4	101.60	21	533.40	38	965.20
5	127.00	22	558.80	39	990.60
6	152.40	23	584.20	40	1016.00
7	177.80	24	609.60	41	1041.40
8	203.20	25	635.00	42	1066.80
9	228.60	26	660.40	43	1092.20
10	254.00	27	685.80	44	1117.60
11	279.40	28	711.20	45	1143.00
12	304.80	29	736.60	46	1168.40
13	330.20	30	762.00	47	1193.80
14	355.60	31	787.40	48	1219.20
15	381.00	32	812.80	49	1244.60
16	406.40	33	838.20	50	1270.00
17	431.80	34	863.60		

FRACTIONAL PARTS OF AN INCH AND MILLIMETER EQUIVALENTS

1/16	1.59	3/8	9.53	11/16	17.46
1/8	3.18	7/16	11.11	3/4	19.05
3/16	4.76	1/2	12.70	13/16	20.64
1/4	6.35	9/16	14.29	7/8	22.23
5/16	7.94	5/8	15.88	15/16	23.81

To find the Millimeter Equivalent from above tables for 8⅞ inches

Example:

8 inches = 203.20 millimeters
⅞ inch = 22.23 millimeters

Total, 8⅞ inches = 225.43 millimeters

1 inch ..... = 25.40 millimeters
1 foot (12 inches) = 304.80 millimeters
1 yard (3 feet)... = .9144018 meter
1 fathom (6 feet). = 1.8288036 meters

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METRIC CONVERSION TABLE

Weights

POUNDS AND EQUIVALENTS IN KILOGRAMS

Pounds	Equivalent in Kilograms	Pounds	Equivalent in Kilograms	Pounds	Equivalent in Kilograms
1	.4536	20	9.0720	39	17.6904
2	.9072	21	9.5256	40	18.1440
3	1.3608	22	9.9792	41	18.5976
4	1.8144	23	10.4328	42	19.0512
5	2.2680	24	10.8864	43	19.5048
6	2.7216	25	11.3400	44	19.9584
7	3.1752	26	11.7936	45	20.4120
8	3.6288	27	12.2472	46	20.8656
9	4.0824	28	12.7008	47	21.3192
10	4.5360	29	13.1544	48	21.7728
11	4.9896	30	13.6080	49	22.2264
12	5.4432	31	14.0616	50	22.6800
13	5.8968	32	14.5152		
14	6.3504	33	14.9688	60	27.2160
15	6.8040	34	15.4224	70	31.7520
16	7.2576	35	15.8760	80	36.2880
17	7.7112	36	16.3296	90	40.8240
18	8.1648	37	16.7832	100	45.3600
19	8.6184	38	17.2368		

FRACTION OF A POUND AND EQUIVALENTS IN KILOGRAMS

1/16 (1 oz.)	.02835	7/16 (7 oz.)	.19845	13/16 (13 oz.)	.36855
1/8 (2 oz.)	.05670	1/2 (8 oz.)	.22680	7/8 (14 oz.)	.39690
3/16 (3 oz.)	.08505	9/16 (9 oz.)	.25515	15/16 (15 oz.)	.42525
1/4 (4 oz.)	.11340	5/8 (10 oz.)	.28350	1 (16 oz.)	.45360
5/16 (5 oz.)	.14175	11/16 (11 oz.)	.31185		
3/8 (6 oz.)	.17010	3/4 (12 oz.)	.34020		

Example:

To find the Kilogram Equivalent for 124¾ pounds

100 pounds = 45.3600 kilograms
24 pounds = 10.8864 kilograms
¾ pound = .3402 kilogram
Total, 124¾ pounds = 56.5866 kilograms

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METRIC CONVERSION TABLE

Weights

KILOGRAMS AND EQUIVALENTS IN POUNDS

Kilograms	Equivalent in Pounds	Kilograms	Equivalent in Pounds	Kilograms	Equivalent in Pounds
1	2.2046	20	44.0920	39	85.9794
2	4.4092	21	46.2966	40	88.1840
3	6.6138	22	48.5012	41	90.3886
4	8.8184	23	50.7058	42	92.5932
5	11.0230	24	52.9104	43	94.7978
6	13.2276	25	55.1150	44	97.0024
7	15.4322	26	57.3196	45	99.2070
8	17.6368	27	59.5242	46	101.4116
9	19.8414	28	61.7288	47	103.6162
10	22.0460	29	63.9334	48	105.8208
11	24.2506	30	66.1380	49	108.0254
12	26.4552	31	68.3426	50	110.2300
13	28.6598	32	70.5472		
14	30.8644	33	72.7518	60	132.2760
15	33.0690	34	74.9564	70	154.3220
16	35.2736	35	77.1610	80	176.3680
17	37.4782	36	79.3656	90	198.4140
18	39.6828	37	81.5702	100	220.4600
19	41.8874	38	83.7748		

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TABLE OF STANDARD WIRE GAUGES

THICKNESS IN DECIMALS OF AN INCH

No. of Wire Gauge	Birmingham or Stubs	American or B. & S.	Washburn & Moen Mfg. Co.	British Imperial Standard Wire Gauge	Paris Wire Gauge
0000	.454	.460	.3938	.400	....
000	.425	.40964	.3625	.372	....
00	.380	.3648	.3310	.348	(P.P.) .0157
0	.340	.32486	.3065	.324	(P.) .0196
1	.300	.2893	.2830	.300	.0236
2	.284	.25763	.2625	.276	.0275
3	.259	.22942	.2437	.252	.0314
4	.238	.20431	.2253	.232	.0354
5	.220	.18194	.2070	.212	.0393
6	.203	.16202	.1920	.192	.0433
7	.180	.14428	.1770	.176	.0472
8	.165	.12849	.1620	.160	.0512
9	.148	.11443	.1483	.144	.0551
10	.134	.10189	.1350	.128	.0590
11	.120	.090742	.1205	.116	.0630
12	.109	.080808	.1055	.104	.0708
13	.095	.071961	.0915	.092	.0787
14	.083	.064048	.0800	.080	.0866
15	.072	.057068	.0720	.072	.0944
16	.065	.05082	.0625	.064	.1062
17	.058	.045257	.0540	.056	.1181
18	.049	.040303	.0475	.048	.1338
19	.042	.03589	.0410	.040	.1535
20	.035	.031961	.0348	.036	.1732
21	.032	.028462	.03175	.032	.1929
22	.028	.025347	.0286	.028	.2126
23	.025	.022571	.0258	.024	.2322
24	.022	.0201	.0230	.022	.2520
25	.020	.0179	.0204	.020	.2756
26	.018	.01594	.0181	.018	.2914
27	.016	.014195	.0173	.0164	.3228
28	.014	.012641	.0162	.0148	.3464
29	.013	.011257	.0150	.0136	.3700
30	.012	.010025	.0140	.0124	.3937

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